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Improved Acoustic Telegraph.

The Acoustic Telegraph is intended by the inventor to supersede the electric, by communicating intelligent sounds across the Atlantic Ocean, or wherever an electric unit is unable to retain its positive character, in its transit through elements rich in electricity. The nature of the invention consists in eliminating phonic units or sounds of similar and dissimilar intensities and chimes from the non-metallic atoms of the atmospheric air, and so arranging them as to constitute a phonic formula, for each letter of the alphabet, each arabic notation and expression of valuation; every one of which is represented by its own distinguishing symbol. These symbols are geometric, mathematic, and astronomic in their form and are sounded by the acouglottic battery, mounted upon the marble pyramid as shown in the engraving. These intensities and symbolic sounds are so conjoined and divided by the silent pauses of diatessarons that several orders of sound are thus created, each one of which represents certain letters when sounded at certain intervals, and consecutively from the different bars of the left diatonic staff. The silent diatessarons are of two kinds, the one calculated by seconds of time, the other by counting numbers. For pulpit and parlor purposes the one of numbers is used; and is divided into silent comma's, equal to a space of time necessary to count one; into silent semicolons, colons, and periods; equal to spaces of time required to count one, two; one, two, three; one, two, three, four, respectively; for distant purposes by land and sea, the one of seconds of time must be used—and is divided into silent commas equal to two seconds of time by the watch—into silent semicolons equal to four seconds of time, into silent colons equal to six seconds of time, and into periods of ten seconds of time.

Fig 1

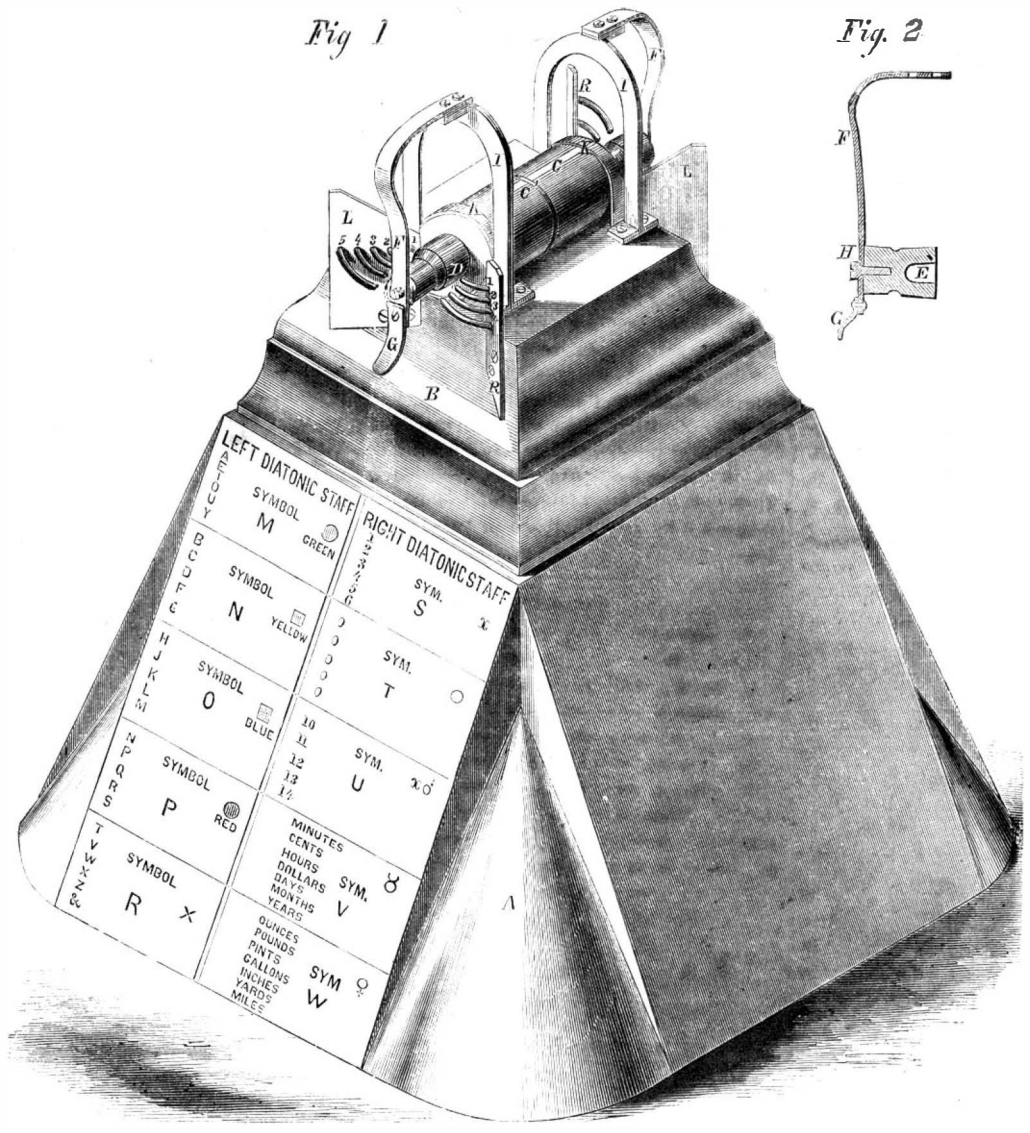

Fig. 2

DR. EVERITT'S ACOUSTIC TELEGRAPH.

The letter A, represents the marble base of the acoustic telegraph; B, the pedestal of the acouglottic battery, whose several parts are named after the ossiculæ of the anatomical ear. C, is the incus; it forms the starting point upon which the different intensities and chimes of sound are elicited from the non-metallic atoms of the air; D, is the malleus; it is made to compress the atoms of the air, suddenly and sharply upon the face of the incus and evoke the silence therefrom. E, in Fig. 2, is the phonic fossa, in the center of the face of the malleus; it regulates the phonic units, and directs them through the incus; F, is the tympanum; it creates and modifies the various intensities and chimes of sound, by striking the facial malleus and phonic fossa upon the facial incus from various distances therefrom. G, is the key; it enables the operator to strike off all phonic formulas classed under the different orders of sound. H, is the orbicular; it receives the various sounds from the opposite side, and inducts them into the nervous papillæ of the index finger and thumb tips which direct them to the spiritual sense of hearing residing within the brain. A copper wire armed with a small metallic nipple at one end and the other inserted into the orbicular, will convey the chime of the sound if the nipple be placed within the acoustic trumpet of the external ear; and while listening and receiving sounds, either the nipple must be worn in the ear, or the tip of the thumb or finger must be pressed upon the orbicular and retained there during the conversation. I, is the stapes; it is mounted over the incus and gives strength and support to the tympanum and key; K, is a metallic rim which encircles the edge of the facial incus and retains the solid cylinder in its place. The lines of division upon the cylindrical incus marked C1 × division represent a bisection of the acouglottic battery, each one of which forms a complete machine, when the two sectional faces of the incus are connected by copper wire; such an arrangement enables not only those who are deaf-and-dumb from anatomical defection, but those who can talk and hear, who by length of distance from each other over land or water are equally deaf-and-dumb to each other, to hear through the wire and converse together. One of these divisions of the battery can also be used for the church services of a deaf-and-dumb audience, by means of radiating copper wires connected and centered in the facial incus, diverging fan-like toward the assembly; so many members, so many wires, the distal ends of which are held by the finger and thumb tips. The clergyman evokes the different phonic formulas at the key end of the battery, and the whole audience simultaneously receive, hear, arrange and construe this phonographic language into the Word of Life. L, is the left diatonic staff. It has five bars from each of which a different order of sound proceeds; and each order is represented by a different symbol. The bars are placed at different distances from the facial incus, and from one another; and together, their sounds represent and express all the letters of the alphabet.

The 1st Bar, creates the vowel order of sounds, M; its symbol is a circular cavity O, colored green; one such symbol sounded expresses the phonic formula of the letter A; two such symbols sounded denote the phonic formula of the letter E, and so on to Y, by sounding six similar symbols consecutively. The 2d Bar, generates the mute order of sounds, N; its symbol is a solid cube colored yellow; one such symbol sounded expresses the letter B; two such symbols sounded denote the letter C, and so on consecutively to five sounds representing G. The 3d Bar, produces the semi-vowel order of sounds O; its symbol is a hollow cube colored blue; one such symbol sounded expresses the letter H; two such consecutive sounds denote the letter J; onward to M, which is denoted by five such sounds. The 4th Bar, incepts the consonant order of sounds P; its symbol is a red disc; one such symbol sounded expresses the letter N, onward to S; which is announced by five such sounds. The 5th Bar, creates the relative order of

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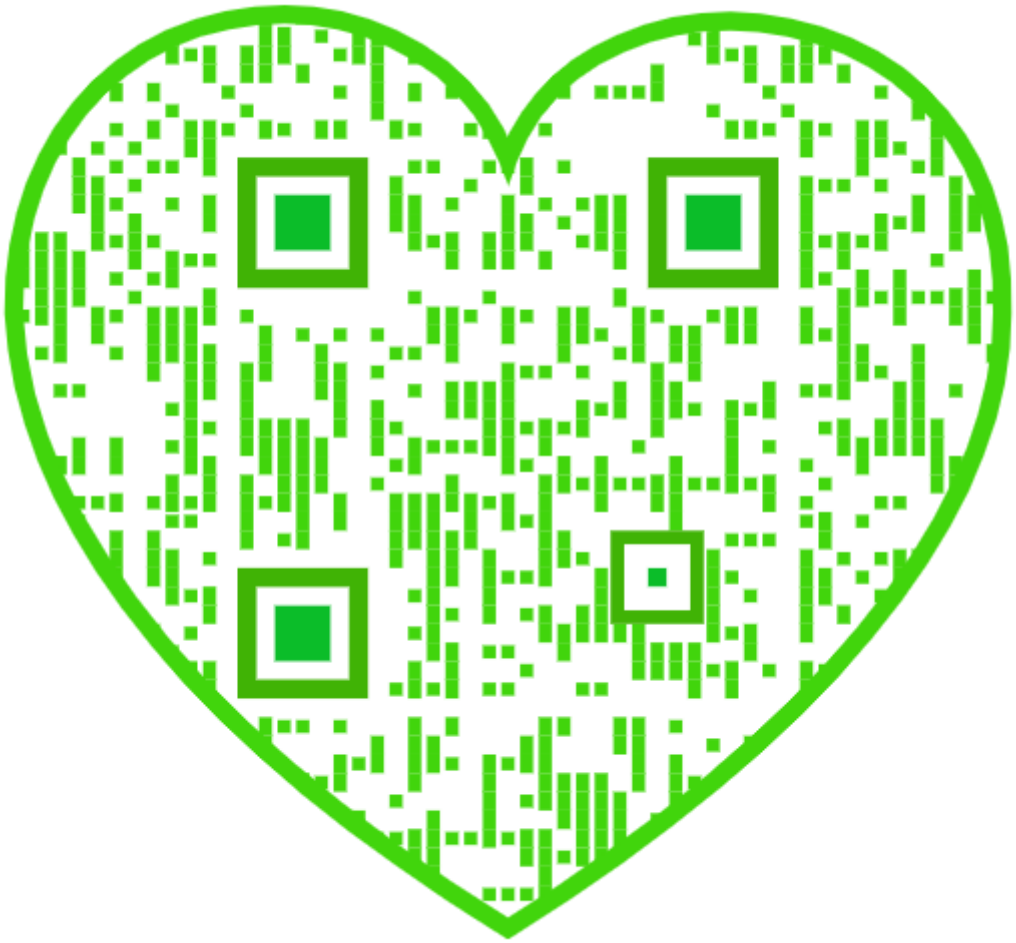


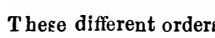
sounds, Q; its symbol is the arithmetic multiplier, ×, colored black; one such symbol sounded expresses the phonic formula of T, onwards to V, W, X, Z, &c. by two, three, four, five, six, consecutive sounds; similar to one another, but differing and dissimilar from the other orders, as each other of them differ from one another.

R, is the right diatonic staff; it is composed of four intermediate bars, and from each one of which an intermediate order of sounds, differing from those of the left diatonic staff, is generated; and each order is represented by a separate symbol. The 1st Bar, creates the fulcimen order of sounds S. Its symbol is the algebraic x, colored black; one such symbol sounded expresses the phonic formula of digits, and one such sound expresses the number one of anything; two such symbols sounded consecutively denote the number two, and so on to nine. The 3d Bar, generates the semi fulcimen order of sounds T. Its symbol is the geometric sphere O, colored black. One such symbol sounded expresses the phonic formula of cyphers; and one such sound simply denotes one cypher 0. Two such sounds consecutively sounded denote two cyphers 0 0, and onward; so many cyphers so many sounds.

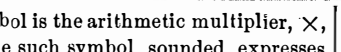
The 1st and 3d Bars conjoined create the Bi-Fulcimen order of sounds U. Its symbol is the XO combined, and expresses the number ten 10—onwards to 99. The 1st and 3d Bar also create the Trifulcimen order of sounds. Its symbol is XOO, and expresses the number 100 onward to nine hundred and ninety-nine. The Quadrufulcimen order of sounds is also created by the 1st and 3d Bars, and denotes the number 1000. Its symbol is XOOO—onward to nine thousand nine hundred and ninety nine: any other new order may be in this way created and added, so that the highest mathematical expression of figures may with ease be registered by the Acoustic Telegraph. The 2d Bar produces the Valorum order of sounds V. Its symbol is the Astronomic Taurus ♉ colored black. One such symbol sounded expresses the Phonic Formula of Minutes of time. Two such symbols sounded consecutively expresses the formula of cents in money—and so on to hours, dollars, days, months, years; the last of which is denoted by seven such symbols consecutively sounded. The 4th Bar incepts the semi-valorum order of sounds W. Its symbol is the astronomic Venus ♀ colored black. One such symbol sounded expresses the Phonic Formula of ounces—fluid or solid. Two such sounds consecutively sounded denote sounds in weight; and so on to pints, gallons, inches, yards, miles—the last of which is expressed by seven such sounds, one directly after the other.

In writing out this phonographic language, the number of symbols to be sounded is placed above them, as their exponents, in all instances—and in sounding the valorum order of sounds the Phonic formula must always precede the amount to be expressed by the fulcimen sounds—one hundred dollars is sounded and expressed in this way: ♉;x̄⁰. that is to say, 4 sounds are to be sounded from the second Bar R D staff, 1 sound from the 1st Bar and 2 from the 3d Bar. The four sounds of Taurus are to be consecutive, then observing the silent semicolon the auditor will know that these four sounds mean dollars; he waits the amount of dollars, and you send him one fulcimen sound and two semifulcimen sounds, directly, one after the other; a silent period equal to counting one, two, three, four, ensuing after the last sound, indicates to the auditor that just one hundred dollars, and no more or less, is the subject of conversation. One thousand miles are thus written and expressed: ♀;x̄⁰. The seven sounds of Venus are to be consecutive, then the silent semicolon and period give force and character to the sound received by the auditor.

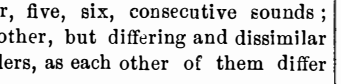
In writing and conversing the sounds of letters and words and sentences are stroked, and are conveyed and received by the listener, who analyses, combines and forms them into intelligencies of the highest order. Conversations may be carried on between those who are absent and those who are present by the following symbols:—



These different orders of sounds sounded in this way express the fact that "God is Love."



denote that "Truth will Prevail."



These are the first words sounded by the Acoustic Telegraph in the order of conversation, and express the fact that "Lincoln is the Liberator Magnus." Whenever the numbers are placed over symbols it implies that each sound is to be sounded rapidly one after the other; and the semicolon denotes that after the phonic formula of any letter has been sounded the operator counts one, two, and after having sounded a complete word he counts one, two, three, and having finished a sentence he counts one, two, three, four, quickly one after another; and whatever the distance, the sounds are received in the same precise consecutive order. The position of the body and limbs is of importance while conversing by means of the Acoustic Telegraph: the head and chest must be upright, dignified, natural and slightly inclined forward; the seat elevated so as to give full view of and command over the key and bars of the Battery, and the arms be well supported by the table upon which it stands: so as to be free to act and move and rest while the one evokes the sounds and the other receives them from the Orbicular or metallic nipple. Those who use the Orbicular must *always* preserve the *left* index-finger and thumb for that special purpose and keep the pulpy tips moist and clean with soap and pumice stone, and never allow the nail to come in contact with it during the time of receiving sounds. The *right* index-finger tip must be *always* the one to *exercise* the key, and never be transferred to the Orbicular. The greatest care must be observed in bringing the edge of the facial malleus directly opposite the points of the Bars from which the phonic formula of all symbolic letters proceed. The point of the index-finger is placed under the key, and drawn from the facial incus to the point of that bar which is to elicit the order and formula of sound required and allowed suddenly to slip from the point in the order directed by silent diatessarons.

A patent for the above was granted on the 17th day of November, 1863. The inventor is Lancelot H. Everitt, M. D., Member of the Royal College of Surgeons, Edinburgh, Resident Physician of New Orleans, La.

New Rebel Guns.

We understand, says the Augusta *Chronicle*, that the second of those monster guns in Charleston has been tried lately, under the direction of a board of officers, with entire success, throwing its huge projectiles over two miles at an elevation of only two degrees, the gun not being yet ready to fire at a higher angle. This is far beyond anything ever done by artillery before. Those immense rifle guns are constructed on a new principle, which permits enormous charges of powder to be used safely, and thus imparts the required momentum to the ponderous shells and solid bolts. The injury sustained by the first gun was an oversight, and, it is understood from good authority, can be effectually remedied. The powder to be used with these guns is now being manufactured at the Government powder works, and is quite a curiosity, looking like anything else than gunpowder; the grains—if they can be so called—being solid blocks, looking like ebony, one inch square, it would be supposed that they were projectiles themselves by their appearance, each grain weighing about an ounce.

[The slow-burning powder and immense strength spoken of are rather difficult things to reconcile.—Eds.

Sugar an Antidote for Worms.—M. Debout says that sugar is an excellent destroyer of worms. He once accidentally put sugar instead of salt on a leech which he wished to detach from the skin, and was surprised at the spasms produced by it. He therefore tried sugar on earth-worms, and found it had a similar powerful effect; and has since used it in solution with success as an injection in children.—*British Medical Journal.*

[The world moves; in old times sugar used to be considered the best possible encouragement for these parasites.—Eds.

EVAPORATION INTO THE ATMOSPHERE.

Our last issue contained a very interesting article by a correspondent on "evaporation," and it was our intention to have added, by way of extension, some other information on the subject; but were prevented from doing so for want of space. Water exposed to dry air evaporates at all temperatures. Sometimes when the atmosphere is below zero, running water, such as the East River at New York, appears like a vessel containing boiling water with steam rising frem its surface. This is caused by the vapor rising from the river into the dry air, being condensed near the surface. The vapor of water rises into air as into a vacuum, according to the same law by which gases diffuse through each other. Dr. Dalton discovered that evaporation of water has the same limit as air in a vacuum. The quantity of vapor which can rise into a confined space is the same whether that space be a vacuum, or filled with air. The vapor rises and adds its own elastic force, such as it exhibits in a vacuum, to the elastic force of the air occupying the same space. Hence it is only necessary to know what quantity of vapor rises into a vacuum at any particular temperature to know that the same quantity will rise into the air. The spontaneous evaporation of water into air is much affected by three circumstances: first, the dryness of the air; second, the temperature of the water—the higher the temperature the greater the quantity of vapor which rises into any accessible space. The water emits so much vapor at 40° as expands the air in contact with it 1-114th part; at 60° as much as expands air 1-57th part—or double the quantity emitted at the lower temperature. Humid hot air, therefore, contains a greater portion of vapor than humid cold air: third, the evaporation of water is greatly quickened by the removal of the incumbent air in proportion as it becomes saturated; hence, a current of air is favorable to evaporation

Wet clothing, exposed to a dry frosty atmosphere, will become dry by evaporation. The drying of wet clothing which is exposed to the air, is owing to absorption of the moisture by the air. In cloth-bleach establishments the goods are dried in large rooms, which are heated by furnace flues carried alongside of the walls close to the floors. The air is warmed in these rooms and the moisture evaporates from the cloth; but the evaporation is not instantaneous. The humid air is allowed to escape by valves as it becomes saturated with moisture, and fresh air is occasionally admitted. Fuel is wasted, however, if the hot air ir allowed to escape before it is fully saturated with vapor. We have known a great waste of fuel caused by the employment of ignorant watchmen, whose duty it was to attend to such drying rooms, by their letting off the hot air before it had become fully charged with moisture. Currents of warm dry air have been employed in some cases to evaporate liquids, under the idea that evaporation was facilitated by this system. But heated air used for such a purpose involves a waste of fuel just in proportion to the quantity of air heated. In the evaporation of water in boilers the heat should always be applied directly to the boiler.

"Plum Muss."

Under this euphonious title the London *Grocer* describes a new article of merchandise. It says:—

"Plum muss or *lekwar* consists simply of pure native plums boiled into a mass, no ingredient whatever being added to it; the plums being so sweet in themselves, they require no sugar. In Hungary it is used in both the cottage and mansion, and is a common article of sale in every provision shop. The poor eat it with their bread, and all classes use it for the several purposes in which our more expensive preserves are found useful. It is of a more solid nature than our manufactured jams, but if found too firm for cooking purposes, it may be thinned with a little lukewarm water as it is required for use, without losing flavor. We are assured that it will keep good for two or three years if carefully stored; it might therefore form an important and economical article of export to our colonies, and for ships' stores it would no doubt prove invaluable. It possesses, as the reader may judge, a very pleasant flavor, is undoubtedly very wholesome, and, in the event of its being properly introduced by a good house, must become a very favorite article with

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housekeepers. It is certainly a novelty, and as it can be obtained in the mass at a very moderate rate indeed, it might be retailed at a price to suit the million.

Russian Preparation for War.

Gen. Todleben is superintending the works for strengthening Cronstadt and barring the approach to the Neva. In one channel leading to the back of Cronstadt, about 300 lighters laden with stones have been sunk, so that now in no part is there more than 4 feet of water. In another channel 300 infernal machines are to be laid, each of which will contain 7 pounds of powder, and explode by a slight touch from a vessel passing over. On the main island of Cronstadt several large earthworks are being thrown up. Some of these earthworks are to be covered with 7½-inch plates, placed on an angle of 45°, and curved over the top so as to form a cover. Another means of defense consists of a submarine boat of colossal dimensions, in the construction of which about 200 tuns of iron and steel are to be used; it is to have engines worked by compressed air, to have a very strong beak, with provision for attaching large cylinders charged with powder to the bottoms of vessels to be fired by electricity.

The parties navigating the vessel will see what they are doing by means of bull's eyes, and they will regulate the depth at which they swim, keeping quite close to the surface. By the 1st of June, 1864, the Marine Department confidently expects to have at Cronstadt 16 iron-clad vessels, and they consider these a very poor fleet for such a Power as Russia. Enormous exertions are being used to obtain the requisite quantity of guns, with suitable ammunition, for all the forts, earthworks, and ships, and it will perhaps be found that the Russians have really got ahead of England in guns, and shot-guns are now being produced in about a dozen factories, working day and night, and in a few days another Elswick will commence. Its production will be solid cast-steel guns, from the 6 pounder to the 11-inch gun, which latter is to fire a 500-pound shell.

To provide the necessary shot and shell to their guns, all the founderies around St. Petersburgh have orders varying from 15,000 to 50,000 each. All the shot and shell from 12-pounders upward are for field-guns. Round hammered-steel shot are also being prepared to suit the naval 60 pound gun. One firm alone has on hand 30,000 of these. Land-artillery forces are also adopting the steel guns for their service. In anticipation of war and the supplies of armor-plates being stopped, two forges are erecting, capable of making 10,000 or 12,000 tuns of armor-plates per year. Large supplies of saltpeter have been purchased during the summer, and the powder-works have been extended, and are working night and day. Flour has been very largely bought for delivery in February, and for those places to which the ordinary route is by water in spring extra prices are being paid for winter delivery. Two years' supply of coals has been provided for the fleet.

Fixing Sounds.

Some months ago, M. Scott, well known among the savans of Paris, exhibited experiments of a very interesting character, in the art of fixing sounds. The same species of natural means so successfully employed in photography with reference to form, namely, the aerial undulations of which sounds consist, are, by the construction of the *phonograph*, made ingeniously to subserve the intricate purposes in view. The representation of the various curves and vibrations performed by an instrument of highly susceptible mobility, while acted upon by these atmospheric movements, has been perfectly accomplished; and although a serious difficulty seems to obstruct a re-translation of this somewhat indefinite language into the regular and fixed signs for the verbal sounds which produced it, M. Scott is sufficiently sanguine about the result to give cause for alarm in the minds of shorthand writers, whose occupation would be more detrimentally affected by this wonderful apparatus for reporting, than even artists have been by the sister invention of photography.—*Exchange.*

[It is a little singular that two different persons on opposite sides of the globe should be employed on this project. Dr. Everitt, of New Orleans, has an engraving of his Acoustic Telegraph on the first page of this number; it is essentially the same thing as that described above. M. Scott is behind the times.—Eds.

Gypsum in Michigan.

At Grand Rapids, Michigan, on the Detroit and Milwaukie railway, are found extensive strata of gypsum embedded in the earth. Aside from the value of this mineral for agricultural purposes, it is capable of being wrought into various objects of utility and ornament. It can be formed into paper-weights, and little cups and vases, which in translucency, capacity of receiving a polish, and soft, beautifully-shaded colors, bear a strong resemblance to the Derbyshire spar. It is of various colors, orange, pale reddish brown, and white mottled with blue. Whether there be any portion of it pure white we are not informed; if there be it is alabaster, and alabaster, it is said, is found in the lower part of quarries of gypsum, though it is found cropping out in the roads over the Appenines. An intelligent correspondent residing at Grand Rapids, says:—"The gypsum beds are immense, and are worked for two miles, one quarry being a large cave, artificial, in the side of a hill. The spar is of a great variety of colors and various degrees of hardness. If it were taken out carefully, so as to prevent what are called shakes, caused by blasting, and put into the hands of a skilful lapidary, ornaments might be made that would rival much of the alabaster work now sold in eastern auction-rooms."

MISCELLANEOUS SUMMARY.

Who are the Happy?—Lord Byron said: "The mechanics and workingmen who can maintain their families, are, in my opinion, the happiest body of men. Poverty is wretchedness, but even poverty is, perhaps, to be preferred to the heartless unmeaning dissipation of the higher orders." Another author says: "I have no propensity to envy any one, least of all, the rich and great; but if I were disposed to this weakness, the subject of my envy would be a healthy young man, in full possession of his strength and faculties, going forth in the morning to work for his wife and children or bringing them home his wages at night."

French Railroads behind the Age.—A body of commissioners appointed two years since by the French Minister of the Public Works to inquire into the state of the French railways, and to suggest improvements, have just issued a voluminous report, in which they recommend accelerated speed, an improvement of day and night signals, a communication between the driver and the engine and the brakesman, and the construction of more commodious second and third-class carriages. To these various suggestions the directors of the railways have promised to give immediate attention.

New Railroad to the Coal Fields.—A broad-gage railroad from West Greenville, Pa., on the Atlantic and Great Western Railroad to the immense coal-beds of south eastern Mercer county, Butler and Armstrong counties, Pa., is projected. Extensive and favorable coal leases have been made as far eastward as Brady's Bend. It has long been known that veins of coal of great thickness underlie the section of country through which this road proposes to pass.

The "Dictator."—An unsuccessful attempt was made on the 29th of November last, to launch the iron-clad *Dictator*. Owing to some difficulties not made public by the builder, and very indefinitely explained by the press, the vessel was unable to leave the ways even with the aid of seven powerful steam tugs. Preparations have been made to launch the vessel next week, when it is hoped the efforts will be more successful.

Dr. Winship, "the strong man," now lifts daily a dead weight of twenty-six hundred pounds. He says he means to get up to three thousand pounds and stop there.

Miles Greenwood's machine shops, in Cincinnati, were destroyed by fire recently. Loss about $200,000.

Preparations are making in Maine for securing a large ice crop. The crop of last year in that State realized $100,000.

The big organ in the Boston Music Hall is getting used to hard work. The musicians insist upon giving concerts with it once or twice a week, and all the people run to hear.

Take the stalks of cabbage, scrape them, leave them in water all night, and the next day cook them like vegetable marrow, and they will be found delicious. A cheap delicacy, truly.

A French law, which ought to be in force in this country, authorizes a farmer to sue his neighbor who neglects to eradicate the thistles upon his land at the proper season.

A London journal says that as the habit of smoking has increased in England that of deep drinking has gone out. That is something in favor of the smokers.

The application of castor-oil to new boots renders them as soft as a buckskin glove. It is also the best application that can be made to render a new boot waterproof.

A white deer has been discovered near the Rice Lakes in Minnesota. It is an albino among the deer tribe. Nothing like it was ever before seen in that region.

About 30,000 tuns of anthracite coal were shipped from Wales last month for the blockade runners at Bermuda.

NEW YORK MARKETS

FOR THE FIRST WEEK OF DECEMBER, 1863.

Bread.—Pilot, navy, and crackers, 4½c. to 8c. per lb.

Candles.—Adamantine, sperm, and stearic, 20c. to 45c. per lb.

Coal.—Anthracite, nut, and egg size, $10 to $11 per 2,000 lbs.

Coffee.—St. Domingo and Java, 22c. to 40c. per lb.

Copper.—Sheathing and ingot, 31c. to 46c. per lb.

Cordage.—Manila, American, and Russian, 17c. to 22c. per lb.

Cotton.—Ordinary, Middling fair, 70c. to 81c. per lb.

Domestic Goods.—Sheetings, 29c. to 40c. per yard; drills, 38c. to 41c.; shirtings, 28c. to 43c.; stripes, 32c. to 42½c.; ticks, 25c. to 65c.; prints, 20c. to 23c.; ginghams, 21c. to 27c.; cotton flannels, 39c. to 46c.; cassimeres, $1 25 to $2 50; woolen flannels, 47c. to 70c.; satinets, 80c. $1; woolen cloth, $1 25 to $10.

Flax.—From 16c. to 22c. per lb.

Flour and Meal, $5 95 to $11 75 per barrel; rye, $5 80 to $7; corn, $6 to $6 25.

Grain.—Wheat, $1 60 to $1 82 per bushel; oats, 87c. to 90c.; corn $1 20 to $1 25.

Gunpowder.—Blasting and rifle, 16c. to 30c. per lb.

Hemp.—American, $150 to $300 per tun.

Hops, 22c. to 30c. per lb.

Iron.—Scotch pig, $42 50 to $45 per tun; American, $43; Bar—Swedes, $125; English, $100 to $105; Sheet—Russia, 17c. to 18c. per lb.; English, 6¾c. to 7½c.

Lead.—Galena, $9 60 per 100 lbs.; pipe and sheet, 12c. per lb.

Leather.—Oak-tanned sole-leather, 39c. to 46c. per lb.; sole hemlock 27c. to 32½c. per lb.

Lumber.—Spruce board, $18 to $22 per 1,000 feet; white oak plank, $35 to $40; white oak staves, $60 to $175.

Molasses.—From 42c. to 65c. per gallon.

Naval Stores.—Turpentine spirits, $3 05 to $3 15c per gallon; rosin, $40 to $50 per barrel of 280 lbs.

Oils.—Linseed, $1 50 per gallon; sperm, $1 60 to $1 90; crude petroleum, 26c. to 30c.; refined petroleum, 50c to 53c.

Silk.—$6 25 to $10 per lb.

Spelter, 8⅜c. per lb.

Steel.—English, 20c. to 29c. per lb.; English spring, 8c. to 15c.; American spring, 6c. to 7c.; German, 10c. to 17c.; English blister, 12c. to 21c.; American blister, 5½c. to 6½c.

Sugar.—Brown, 11⅛c. to 15½c. per lb.; white, 15⅞c. to 17⅜c.

Tallow.—12c. to 12½c. per lb.

Tea.—From 48c. to $1 32 per lb.—20 cents duty.

Tin.—Banca, 55c. per lb.; English, 43c.; plates, $9 25 to $13 per box.

Tobacco.—Connecticut fillers and wrappers, 20c. to 45c. per lb., Ohio fillers and wrappers, 15c. to 30c.; Cuba fillers and wrappers, 90c. to $2.

Wool.—American Saxony fleece, 70c. to 85c. per lb.; Merino, 70c. to 80c.; California (unwashed), 25c. to 55c.

Zinc.—12¾c. to 13c. per lb.

The stock of coffee on hand in New York is 44,270 bags.

Coal is scarce and maintains its former high price.

The price of cotton is slightly lower than at the same date last month, but the demand for it is fair, and we have been informed by an importing merchant, that foreign cotton goods have advanced seven per cent. during the past month, and there is not the least prospect of their being any lower next season. A lot of 125 bales sea-island sold last week at auction for 89 and 97 cents per pound. The total import for last month has been 26 307 bales.

Flour has advanced about 20 cents per barrel. Corn is higher than it has been for a great number of years. This is generally attributed to the loss of crop by early frost, but we have also been assured by a merchant from Wisconsin, who had recently traveled extensively through Illinois, that there was less corn planted this year than last.

Pig iron is scarce and advancing in price, and the Philadelphia *North American Gazette*, states that the Pennsylvania rolling mills are generally full of orders for bar and plate.

Sugar has scarcely changed, but there is no prospect of a fall at present, as foreign sugars have advanced.

The import of wool into New York since Dec. 29, 1862, has been 44,012,278 pounds. Higher prices are ruling for the best qualities of Saxony, Australasian and English fleeces.

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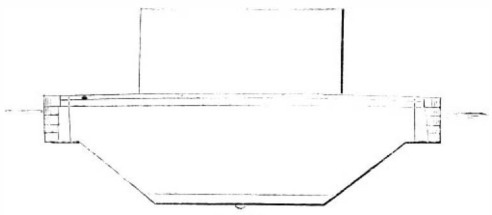
THE MONITORS.

Barely two years ago the keel of the *Monitor* was laid at Greenpoint, L. I. on the 6th of March, 1862, she started on her eventful trip, the result of which materially changed the aspect of our present war. On the 9th of March ensuing she engaged the rebel steamer *Merrimac*, and in a five hours contest completely demonstrated the practical character of her construction, and the impregnability of her iron mail.

Whoever may claim to be the originator of the revolving turret, it cannot be denied that to Captain John Ericsson belongs the singular merit of first making a useful application of it; and of so combining it with a hull, which should have but a small area exposed above water, as to form a vessel preeminently fitted both for attack and defense. With a few trifling exceptions all the distinguishing features of the monitor class of vessels are Captain Ericsson's invention; and if an inventor is justified in feeling proud of his work, the man who has saved a nation's reputation may well congratulate himself. Built as she was, in haste, under many disadvantages, the *Monitor* contained some features which experience and greater facilities for the construction of iron ships, have caused to be modified. Of such are the great projection of the armor shelf forward and aft, the position and shape of the pilot-house, and the peculiar shape of the hull; which last peculiarity is shown in the midship section below.



Monitor.

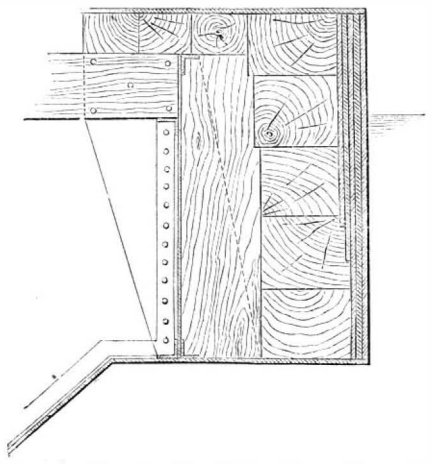
The straight lines, so unlike those of an ordinary vessel, were adopted merely to save the time needed to bend the frames and plates. For about 70 feet amidships this same cross-section was preserved; making, as one conversant with such matters will perceive, a material reduction in the amount of work involved in building the hull. The deck plan was also parallel for somewhat over 80 feet and terminated at both ends in the shape of a gothic arch, with curves of 75 feet radius. The pilot-house was situated 26 feet from the bow; its outside dimensions were 60 inches in width, 50 inches in length (fore and aft) and 47 inches high above the deck; it was composed of iron beams 9 inches thick, fitted at the corner log-cabin fashion.

We will now give some of the principal dimensions of the *Monitor*, premising that we have been at considerable pains to obtain data; which, in the case of this and the others of its class, should be reliable. This we have been induced to do from the fact that newspaper reporters, though well known to be a hard-working set of men, make statements which, especially in mechanical matters, are not wholly trustworthy:—

Extreme length on deck over armor 173 feet.
Extreme beam on deck over armor 41 feet 6 inches.
Depth, 12 feet.
Length of iron hull 127 feet.
Beam of iron hull 36 feet 2 inches.
Depth of iron hull 6 feet 6 inches.
Projection of armor shelf, forward, 14 feet.
Projection of armor shelf, aft, 32 feet.

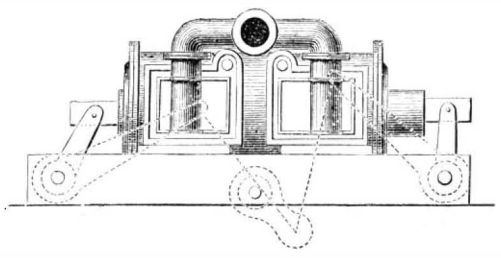
The thickness of the side armor was 5 inches above the water-line and for a short distance below it, thence diminishing to 3 inches at the bottom. The armor was made of inch plates, laid one over another so as to break joints; and fastened to the wood backing by blunt bolts.

The wood backing was made thus:—Blocks of wood 3 feet 3 inches in length, about a foot in width, and varying from 14 inches in thickness at one end to 12 inches at the other, were placed vertically against the side of the vessel, with their broad ends resting on the armor shelf. These blocks were placed close together the whole length of the ship, and outside of them were fastened five horizontal courses of timber, as shown in the sketch. Outside of this was the armor. The entire thickness of the armor and its wood backing was 2 feet 8 inches. From the armor shelf to the deck measured 5 feet, which of course was the hight of the mass of wood and iron by which the hull was protected, and through which, as will be seen by the section, or through some 18 feet of water, a ball must pass to damage the body of the vessel. The deck plating was 1 inch thick. The hull was of $\frac{1}{2}$-inch iron, with angle iron frames 18 inches apart, and 12 inch cross-floors on every alternate frame. The deck beams were 10 inches square, 3 feet from center to center and the deck was of 7-inch plank. The turret was made of eight



Armor Backing and Armor of the Monitor.

thicknesses of 1-inch iron plate; its inside diameter was 20 feet and hight 9 feet. It contained two 11-inch guns mounted on wrought-iron carriages, arranged side by side and revolving with the turret. Their recoil was checked by friction brakes applied to the sides of the gun slides. The portholes were each closed by a heavy iron shutter, which swung over them after the manner of a pendulum, when the gun recoiled. The engines had two horizontal cylinders, 40 inches diameter and 22 inches stroke; the two cylinders were cast in one, with a diaphragm in the middle of its length. A "half trunk" with the usual link, connected the piston to a rock shaft, which transmitted the motion to the main crank; as the same style of engine is used in most of the monitors a diagram is given to show the position



of the parts. The valves were the ordinary three-ported balanced slide, the cut off by a separate slide valve. The reversing was effected by a peculiar arrangement of Captain Ericsson's by which the eccentrics were turned half round, thus dispensing with the link-motion. The air-pump which was also horizontal and placed aft of the cylinders, was enclosed in the ordinary jet condenser and was worked from an arm on the port rock shaft. The boilers, of which there were two, were horizontal tubular, each containing 172 tubes, $2\frac{1}{4}$ inches in diameter by 10 feet 2 inches long, and having nearly 3,000 square feet of fire surface and 93 square feet of grate surface. The propeller was a four-bladed one, 9 feet diameter and 16 feet pitch.

PASSAIC CLASS.

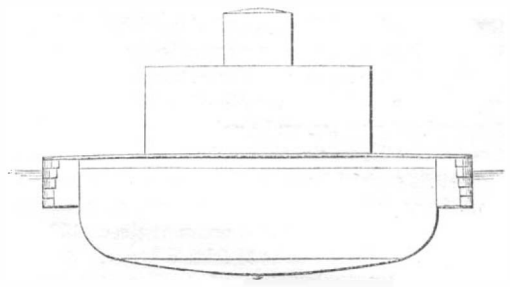
When the little *Monitor* had so triumphantly vindicated the principles of her construction, it was at once determined to build nine more on a similar plan, with such modifications as experience had suggested.

Their names were

Camanche	*Nahant*	*Montauk*
Catskill	*Nantucket*	*Patapsco*
Lehigh	*Passaic*	*Sangamon*

Length on deck 200 feet.
Width on deck 45 feet.
Depth on deck 12 feet.
Length of hull proper 159 feet.
Width of hull proper 37 feet 8 inches.
Overhang of armor shelf forward 16 feet.
Overhang of armor shelf aft 25 feet.
Tunnage 844 tuns.
Draught of water 10 feet.

All were alike in model and every other particular, and the following cross section and dimensions apply equally to every one of this class.



Passaic Class.

The hull is made of $\frac{1}{2}$-inch plates except the garboard strake which is $\frac{5}{8}$-inch thick. The frames, which are placed 18 inches from face to face, are of 4-inch by 4-inch angle iron and on each alternate one is a 16-inch cross floor, topped with two bars of $3\frac{1}{2}$-inch by $3\frac{1}{2}$-inch angle iron. The deck timbers are 12 inches square and 3 feet from center to center, and the deck is of 7-inch plank. The thickness of the side armor is 5 inches, composed of five 1-inch plates, and the entire thickness of armor and wood backing is 3 feet 8 inches. The deck is plated with two thicknesses of $\frac{1}{2}$-inch plate. Both side and deck armor are attached to the woodwork by blunt bolts. The turret is made of 11 thicknesses of 1-inch plates, and is 21 feet inside diameter and 9 feet high, containing either one 11-inch and one 15-inch gun, or a 150 ℔. Parrott gun instead of the 11-inch gun. On the top of the turret is the pilot-house, cylindrical like the turret, and of 8 thicknesses of 1-inch plates; it is 6 feet inside diameter and nearly 6 feet high. The turret revolves around a fixed vertical shaft, 12 inches diameter, which may in action, be keyed up from below so as to relieve the iron ring in the deck, on which the turret bears from a large part of the superincumbent weight. To the top of this shaft the pilot-house is attached and consequently it does not turn with the turret. The rods which connect the steering wheel with the rudder pass down in grooves in the side of this shaft, as does also the rod by which the turret engines are started, reversed, or stopped.

The portholes are closed in a different and much better manner than those of the *Monitor*. Instead of the pendulous shutter there is a heavy crank-shaped forging, the axis of which is vertical and nearly opposite the center of the porthole. When this is turned in one position the offset of the crank portion will allow the muzzle of the gun to reach the port-hole, while a quarter of a revolution of this port-stopper brings the solid metal directly opposite the opening and effectually closes it. Under the turret is the turret chamber, formed by two athwartship, and two fore and aft bulkheads, which support the deck below the turret, and for that purpose are heavily braced with angle iron. This chamber is about 15 feet square and the whole depth of the hold. Through the center of it run two fore and aft keelsons, 35 inches deep and $\frac{5}{8}$ inches thick, resting directly on the 16-inch cross floors, and topped and bottomed with 4-inch by 4-inch angle iron, which support a step for the vertical shaft above mentioned, a portion of the strain on which is also transferred to the fore and aft bulkheads by two pairs of braces running from the step to the top of the bulkheads like the two sides of the letter V. This chamber contains, in addition to the two engines which move the turret and which have cylinders 12-inch diameter and 16-inch stroke, two vertical engines with cylinders 10-inch diameter and 12-inch stroke, which drive the blowers by which the ship is ventilated. The main engines are precisely like those of the *Monitor*, driving a propeller 12 feet diameter and 16 feet pitch. There are two of Martin's boilers, each containing three furnaces and having a total heating surface of about 3,600 square feet.

HARBOR AND RIVER MONITORS.

This class of monitors consists also of nine vessels, named:—

Canonicus	*Manhattan*	*Catawba*

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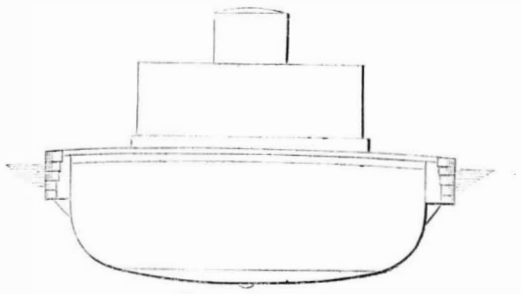
Oneota	*Mahopac*	*Saugus*
Manayunk	*Tecumseh*	*Tippecanoe*

Their principal dimensions are as follows:—
Length on deck 224 feet.
Width on deck 43 feet.
Depth on deck 13 feet 6 inches.
Length of iron hull 190 feet.
Width of iron hull 37 feet 6 inches.
Projection of armor shelf forward 9 feet 6 inches.
Projection of armor shelf aft 24 feet 6 inches.



Tippecanoe Class.

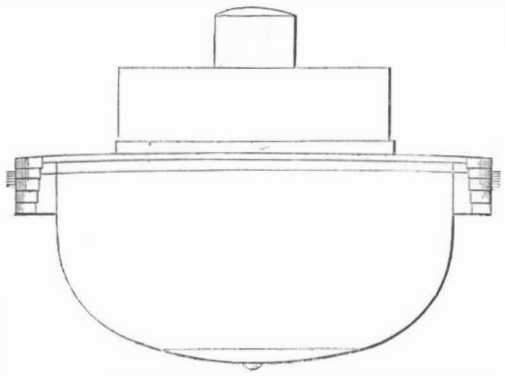
The hull is of ½-inch plates, garboard strake ⅝-inch. Frames 4-inch by 4 inch, 18 inches apart, and on every alternate one a 16-inch cross floor of ½-inch iron, topped with two bars of 3½-inch by 3½-inch angle iron. Deck timbers 12 inches square, and 3 feet from center to center, deck of 7-inch plank. The side armor is of 5 thicknesses of inch plates, in addition to which the vessels of this class have two massive bars of iron called "armor stringers," running entirely around the ship, under the armor, and serving to support it near the water-line. These stringers are 6½ inches wide by 6 inches thick for about 70 feet at the bow, and for the remaining distance they are 6½ inches wide by 4 inches thick, thus making the armor in the part most liable to be hit nine inches in thickness. The deck armor is of two plates, the upper one 1-inch and the lower one ½-inch thick. To provide against such an accident as happened to the *Monitor*, there is introduced in the angle formed by the sides and the armor shelf a plate iron sponson, the space behind which is filled in with pine wood; the thickness of armor and wood backing is 2 feet 8 inches.

The turret is made of 10 thicknesses of inch plates, is 9 feet high and 2 feet inside diameter. To avoid being disabled as the *Passaic* was, in the first attack on Charleston, the base of the turret is strengthened by a band of iron 15 inches wide and 5 inches thick, having its outer edges well rounded so as not to be "upset" by any chance shot. Instead of the original arrangement by which the recoil of the gun was checked, a more complicated plan is adopted, by which the friction is produced on the periphery of a wheel which is connected to the gun carriage by a train of gearing; much greater control is thus obtained over the motion of the carriage, but at the expense of simplicity. The pilot-house is like the turret, 10 inches thick and 6 feet inside diameter. The turret engines have cylinders 12-inch diameter and 16-inch stroke; those of the blower engines are 15-inch diameter and 12-inch stroke, and each drives one of Dimpfel's 60-inch blowers. The main engines are similar to those of the *Passaic* class, but are considerably larger, having cylinders 48-inch diameter and 24-inch stroke. Instead of the jet condenser they have a surface condenser containing 5,367 ½-inch tubes, each 5 feet long, through which the steam passes. The auxiliary engine for working the air-pump which stands aft of the main engine is of the beam variety, with a cylinder 23¾-inch diameter and 23-inch stroke; at each side of the main beam and moving with it is a shorter one, the one of which works two air-pumps 22-inch diameter and 15-inch stroke, and the other two circulating pumps 18-inch diameter and 15-inch stroke. The two main boilers are of the horizontal tubular pattern, each one containing six furnaces, and 384 tubes 8 feet in length, and varying in diameter from 3½ inches in the bottom row, to 2¼ inches in the top row. In addition to these there are two auxiliary boilers, each with one furnace and 64 tubes, like the main ones. The total heating surface in the four boilers is 7,500 square feet. The propeller is a four-bladed one of cast-iron, 14 feet diameter and 20 feet pitch.

DICTATOR AND PURITAN.

The next vessels of the monitor class in order of construction are the *Dictator* and *Puritan*. They are the largest and by far the most powerful of any which have been built in this country, and contain many improvements not embodied in the others. The model, which is a very fine one, is exactly alike in both, save that in the *Puritan* 31 feet has been added amidships. The *Puritan* also is to have two turrets in place of the *Dictator's* one; in other points the description of one vessel will answer for both.

Puritan.—Length on deck, 351 feet.
Width, 50 feet.
Depth, 21 feet 8 inches.
Length of iron hull, 300 feet.
Width, 41 feet 8 inches.
Dictator.—Length on deck, 320 feet.
Width, 50 feet.
Depth, 21 feet 8 inches.
Length of iron hull, 270 feet.
Width, 41 feet 8 inches.
Projection of armor shelf forward, 19 feet.
Projection of armor shelf aft, 31 feet.



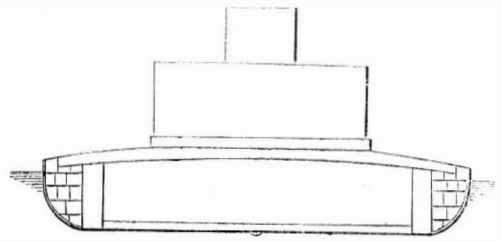
The keel is made of 1-inch iron, the garboard strake of ⅞-inch plates, and the rest of the hull of $1\frac{3}{16}$-inch plates. The frames are of 6-inch by 4½-inch by ⅝-inch angle iron, the long leg being inward, and spaced 18 inches from face to face. On every alternate frame is a 20-inch cross-floor of ⅝-inch plate, topped with two bars of 3½-inch by 3½-inch angle iron. The deck beams are of oak, 3 feet from center to center, and 14 inches square. The deck is of 9-inch plank. There are six 1-inch plates in the armor, and these are further strengthened and supported by three armor stringers, 4½ inches thick and 7 inches wide, running completely around the ship; making the entire thickness of armor near the water-line no less than 10½ inches. The thickness of the armor and its wood backing is 48 inches, and its height 72 inches. The deck is plated with two 1-inch plates. The turret is 26 feet in side diameter and 9 feet high; its thickness is 15 inches, distributed thus:—inside are four courses of 1-inch plates, outside of these are bars of iron, 5 inches thick and 11½ inches wide; running around the turret, and outside of these are four more courses of plates, the whole forming a structure of great firmness. The rivets which unite the inner parts of the turret do not pass through the outer courses of plates, and so the danger of bolts being driven through is entirely obviated. The turret will contain two of Mr. Ericsson's new wrought-iron guns, 13-inch bore, and fitted with the new friction gearing. The pilot-house is of 12 thicknesses of 1-inch plates. The arrangement of turret and blower engines is similar to that in the other monitors. The main engines differ from those before described in having their cylinders vertical instead of horizontal; but the arrangement of trunks, links, rock shafts, and connecting rods is the same, slightly modified to suit the change in the position of the cylinders. The two cylinders are 100 inches diameter and 48 inches stroke; and the common air-pump and jet condenser are used. There are six of Martin's boilers, each having ten furnaces arranged in two rows. The six boilers will have 1000 square feet of grate surface, and a total heating surface of about 30,000 square feet. The propeller is a four-bladed one, of cast-iron, 21 feet 6 inches in diameter, and 30 feet pitch.

LIGHT-DRAUGHT MONITORS.

This is the latest modification of the turreted battery, and is intended for river navigation, and consequently draws only 6 feet of water when ready for action. The names are as follows:—

Casco	*Modoc*	*Tunxis*
Chimo	*Napa*	*Umpqua*
Cohoes	*Naubuc*	*Wasuc*
Etlah	*Nauset*	*Waxaw*
Klamath	*Shiloh*	*Yazoo*
Koka	*Suncook*	*Yuma*
	Squando	

The form of cross-section is shown in the cut.



The inner iron hull has vertical sides and a flat bottom, both of ½-inch iron plates, and has the usual angle-iron frames, and 12-inch cross-floors. All around this is a water compartment, also with vertical sides 2 feet wide; and outside of this are the "wooden walls" 4 feet thick, of pine, covered with three 1-inch plates for a distance of three feet from the deck; so that if in action the deck is only 18 inches from the water the plating extends only 18 inches below it. The deck beams are put close together so as to dispense with the use of deck planks, and are covered with two thicknesses of ½-inch plate. The water compartment of course serves to vary the draught as may be found necessary, and is readily freed from water by powerful Andrews's pumps. The principal dimensions are as follows:—

Length on deck, 225 feet.
Width, 45 feet.
Depth from top of deck beams to bottom plate, 9 feet.
Length of iron hull, 183 feet 9 inches.
Width, 33 feet.
Depth of deck beams at center, 15 inches.
Depth of deck beams at ends, 12 inches.

The arrangement of turret and blower engines does not differ materially from that of the other monitors. The turret is surrounded at the base by the same iron ring as is used in the *Tippecanoe* class; is, like that, 21 feet inside diameter and 9 feet high, has 8 thicknesses of inch plates, and will probably contain one 11-inch Dahlgren and one 150-pound Parrott gun. The pilot-house has two more courses of plates than the turret, making its thickness ten inches.

To give the vessels the ability to turn in a narrow channel, they are furnished with two propellers, 9 feet diameter (6 feet immersion) and 12 feet pitch. Each propeller is driven by a single inclined engine, having a cylinder 22 inches in diameter by 30-inch stroke, and capable of running at very high speed. The surface condenser and engine for producing a vacuum does not differ materially save in size from those of the *Tippecanoe* class. The boilers are of the horizontal tubular construction, and have 3,900 square feet of fire surface, and 144 feet of grate surface.

Besides the foregoing vessels, the whole of which were mainly planned by Mr. Ericsson, or under his supervision, there are quite a number building which are to have revolving turrets, but differing from those we have mentioned in many particulars. Such are the *Roanoke*, the *Onondagua*, the *Agamenticus*, *Monadnock*, *Tonawanda*, *Miantonomo*, and some others, of which it is as yet too early to give descriptions.

IRON CLAD.

TALENT APPRECIATED BY TALENT.—The notion that genius will excite the deepest reverence in those by whom it is least understood is an ever-recurring yet manifest delusion. Talent is best appreciated by talent; and the man who imagines that the higher he is removed above his judges the more they will admire him, might equally expect that he would look larger the farther he receded, or his voice sound louder the greater the distance from which he spoke. Excellence must be perceptible before it can be applauded, and for a cultivated understanding to display its stores before untutored ignorance is much like exhibiting colors to the blind.

TO IMPART a fine flavor to ordinary tea, place rose leaves in the tea canister, or add one drop of the ottar of roses on a piece of soft paper to every pound of tea, and keep the canister closely covered.

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Correspondence

Circular Saws and the Power to Drive Them.

MESSRS. EDITORS:—On page 170, Vol. IX. (current series) SCIENTIFIC AMERICAN, there is an article on the power to drive circular saws, in which you state "practical and minute information furnished on these points by those engaged in saw-mills, would be very interesting to a large number of the readers of the SCIENTIFIC AMERICAN." I will give some of my experience with circular saws in cutting California timber.

The power required to drive circular saws does not depend so much upon the kind of timber to be sawed, unless the timber is springy, dry, and contains much resin; the latter being liable to adhere to the saws and cause undue friction. Circular saws should be made of good steel, not too hard, free from flaws, and 1-20th to 1-24th of an inch thicker at the middle than at the edge. Very hard and imperfectly-tempered saws will get hot sooner than soft steel saws; and when hot they are liable to warp. Some sawyers prefer to have circular saws perfectly straight (true planes); others prefer a saw with one side a perfect plane, and the other side, next the log, slightly rounded, increasing in thickness toward the middle.

If we take a 4 foot circular saw and use it in cutting hard timber with such a feed that the saw will spring and warp, and then use the same saw in cutting soft timber with a high feed, it will be found that about the same power is required in cutting both kinds of the timber. In cutting dry timber, the saw is more liable to heat than in cutting wet and green timber; and as a saw is liable to warp when it becomes hot, it will therefore stand to be driven by more power in wet than dry timber. Some sawyers doubt this, but it is nevertheless a fact.

The power required to drive a circular saw chiefly depends upon the speed given to it. This is a law of mechanics. I think that a good 4 foot circular saw, run at 9,000 feet speed per minute at the periphery, cutting plank about 20 inches in width, will require from 50 to 60 horse power to drive it; but the average run of circular saws cannot afford to be driven with above 40 horse-power. The power required to drive a circular saw depends in a measure on the thickness of the plate. A thin saw, if it remains stiff, cuts more easily than a thick one, because it removes less timber in cutting, and it therefore requires less power to drive it. Large saws are made thicker than small ones, for the purpose of retaining their stiffness, therefore more power is required to force them through the timber.

G. HAGENMEYER.

Big River, California, Oct. 24, 1863.

Low Water in Steam Boilers.

MESSRS. EDITORS:—Have the goodness to inform me which, in your opinion, is the proper course to pursue with a steam boiler that is overcharged with steam, caused by overfiring—the water at a good hight; or if the boiler is heavily taxed by steam caused by "low water," the sheets all around the exposed parts being extra-heated and consequently weakened—should the engine be started, or the safety valve raised? By doing the latter, if I understand rightly, the remaining water, highly heated, rises instantaneously upon the exposed surfaces and quickly flashes into steam. Under these circumstances would it not be better to start the water instead of steam, which would cause the water to fall in the boiler and apparently not enhance the danger of an explosion, as in the old way of blowing off steam at the safety valve, to afford what might be considered relief to the boiler? Your reply will much oblige

Yours respectfully,

GEORGE MANN, Jr.

Ottawa, Ill., Nov. 27, 1863.

[Draw the fires without delay; let the safety valve alone. The blow-cock should not be used, for when the fires are drawn the danger is past, and the delay caused by refilling the boiler is sometimes a source of great loss. A boiler never can become overcharged with steam if the safety valve is properly loaded and cared for; in case it does, however, there is not much probability that it will be discovered until the trouble is past remedying.—EDS.

ZINC OR SPELTER AND BRASS.

Zinc is one of the most useful of metals, and is very extensively employed for a variety of purposes. In the form of sheets it is generally known as a white metal having a bluish tint. It was first introduced into Europe from India under the name of "spelter"—which it still retains as an article of commerce. It is a comparatively soft metal and at low temperatures is brittle, but when heated to about 300° Fah., it is ductile and malleable; yet, strange to relate, it again becomes very brittle when heated to about 450° Fah. Its malleability at a moderate heat is a valuable property, because it can then be rolled into sheets and drawn into wire. Like iron and copper, it becomes hard by rolling, but is annealed by exposure to a moderate heat. It is not a strong metal, and hence is not adapted to withstand great strains. It is also comparatively volatile, inasmuch as when it is exposed to a bright red heat it passes off in the condition of a metallic gas; and if this gas is ignited, it will burn in contact with the air, emitting a brilliant white light. It is so combustible, indeed, that very fine turnings of it may be ignited when exposed to the air, and the product of this combustion is a white oxide—known as "zinc white." It is one of the most oxidizable of metals, and is always decomposed in the presence of water. This property renders it valuable for generating electric currents. In a galvanic battery the oxygen of the water unites with the zinc, which is called the "positive metal," liberating hydrogen and generating electricity. It also possesses the property of combining with many other metals to form useful alloys; and it is now extensively employed for coating (galvanizing) iron.

The ores of zinc are very abundant in the United States, yet it is not more than fifteen years since these were first successfully worked. The first metallic zinc made in America was produced by Mr. John Hitz, in 1838, for mixing with copper, to make the brass designed for the standard weights and measures ordered by Congress. It was made at Washington from the zinc ore of New Jersey; but the process was expensive. It was several years later ere American zinc ores were profitably worked for commercial purposes. At present there are several large zinc-smelting establishments in successful operation. The oldest, we understand, is that of the New Jersey Zinc Company (located near Newark), in which about three thousand tuns of zinc white for paint are manufactured annually. The red oxide of New Jersey is that from which the zinc white is made. It contains some manganese, and oxide of iron called Franklinite, which is left as a refuse of the zinc ore, and afterward converted into a peculiar quality of cast-iron. There is also another large zinc establishment in New Jersey where zinc white is manufactured; and at Bethlehem, Pa., there is a very large establishment in which the silicate and carbonate ore of zinc is smelted. There may be some smaller establishments unknown to us located in other parts of the country.

In treating our native zinc ores, most attention has been bestowed upon the production of white oxide, which has lately been so much used as paint. In manufacturing it, the ore is first crushed, then roasted in furnaces through which a current of air is drawn by mechanism; the gas of the zinc is burned and carried along in tubes, then cooled and conducted into large bags, into which it falls in the form of white powder—a process first conducted by Mr. Jones, at the Newark Zinc Works. After this it is ground with bleached linseed oil and is fit for use in painting; not being subject to become black when exposed to sulphuretted hydrogen, it has become a substitute for white lead in painting the interior of buildings. A painter has informed us that it has one defect when old and another coat of paint is laid upon it, that the new paint blisters and chips off. A remedy for this evil is much desired.

More attention than has yet been bestowed upon the question should be directed to the manufacture of metallic zinc from our native ores. In the works at Bethlehem, Pa., about three tuns of metal of very superior quality are produced daily; but large quantities of zinc are still imported from abroad, in the form of sheets and other articles, the value of which exceeds one million of dollars. Very large quantities of it are required for the positive plates of galvanic batteries, for galvanizing iron, for sheets and for mixing with copper to make brass.

In England brass is made direct from the calamine (carbonate) zinc ores by mixing 40 pounds of copper with 60 pounds of calamine for a charge with ground charcoal. These quantities make about 60 pounds of brass. We have been given to understand that no brass is made in this country from zinc ores. A good business, we think, might be conducted in thus manufacturing brass from our native metals. Nearly a million dollars worth of brass sheathing (Muntz metal) is imported annually, and about quarter of a million dollars worth of other brass articles. We have abundance of zinc ores and the finest native copper in the world; therefore, all our brass should be home-made. In this direction there is a good opening for new undertakings.

New Jersey zinc ore contains some arsenic, which, unless removed, would render the metal made from it of much less value. According to the chemist Maillet, the arsenic in commercial zinc may be removed by first melting it, then granulating, by pouring it while in a molten state into cold water. After this four parts of the granulated zinc and one part of niter are placed in a crucible—a small portion of the niter being placed on the top and a similar quantity on the bottom—when the whole is heated in a furnace until combustion ensues. The crucible is then removed and the slag skimmed from its surface, when the zinc may be run into molds. The absence of arsenic may be ascertained by dissolving some of the zinc in pure dilute sulphuric acid, and allowing the evolved gas to pass along a German glass tube, a portion of which is kept at a red heat. If arsenic be present a dark-colored ring of this metal will be formed round the tube where it is highly heated. If no deposit takes place the zinc may be considered free from arsenic. As sulphuric acid sometimes contains a little arsenic, care must be exercised to use a pure article for this delicate test. Lead in zinc white renders it unfit for paint, as it is liable to become black like white lead. The lead may be detected by applying a little dilute sulphide of ammonium to the paint, which will become dark if it contains lead. Artists who employ zinc white should subject it to this test.

Preserving Sweet Potatoes.

The following mode of preserving sweet potatoes is given in the last report of the Agricultural Department at Washington, by J. C. Thompson, of Tompkinsville, Staten Island:—

"For winter use, after the first frost select a dry, clear day. Cut the vines with a scythe, leaving the stem to which the potatoes are attached, three or four inches long, to lift them by. The vines are readily eaten by cattle. Use a fork for raising the potatoes; lift them by the stem, and lay them on the ridge to dry. In a few hours they will be ready to pack. Prepare plenty of dry cut straw (old straw is preferable), and take straw and barrels or boxes to the field. Select the best potatoes, handling them carefully without bruising them. Put a layer of straw at the bottom of the barrel and then alternate layers of potatoes and straw until it is filled. The potatoes should be placed close to each other, one at a time, and handled as carefully as eggs. The barrels are then to be moved to a dry room or cellar, where there will be no frost. If they are placed in a cellar they must be raised from the floor, and must not touch the wall. Keeping warm and dry is the secret of their preservation. They will keep six or eight months and improve in quality. From one plot of ground 39 by 100 feet, I gathered, in October last, 43½ bushels."

IN a crusade against hoops a physician of Australia says they are the cause of hernia, varicocele, &c., to a frightful extent. In spite of all the tirades against the "skeletons" they hold their ground in public favor.

THE French cuirassed frigates have made another experimental voyage; this time to try their speed. The highest attained was made by the *Solferino*, which was 14 knots under all steam. The heavier plated and armed vessels fell far short of this.

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Earthquakes.

A recent number of the *Family Herald* (London) contains an article on the subject of earthquakes, from which we condense the following interesting extracts :—

"In the year 1750, a certain madman (or worse—a cunning quack), a trooper in His Majesty's Dragoons, for purposes only known to himself, predicted that a fearful earthquake would take place in England, which would destroy a great part of London. To avoid being swallowed up on the night predicted, the 8th of April, thousands of persons, including a great number of those of rank and fortune, passed the night of the 7th in their carriages and in tents erected for the purpose in Hyde Park. Of course the prophecy, based neither upon revelation nor upon any data given by science, failed, but the fear was undoubted. But within five years afterward, on November, 1, 1755, a terrific earthquake took place at Lisbon. In about eight minutes most of the houses and upwards of 50,000 inhabitants were swallowed up, and whole streets buried. The cities of Coimbra, Oporto, and Braga, suffered dreadfully, and the town of St. Ubes was wholly overturned. Whilst some of the inhabitants ran affrightedly to pray in churches to the images of the Virgin or their patron saints, others, hard-hearted wretches, the denizens of jails, loosened from their captivity by the shock, perpetrated murders and unheard-of cruelties, and robbed and pillaged the wounded and frightened inhabitants. In Spain, a large part of Malaga was destroyed, and the area of destruction extended to Fez, in Morocco, one-half of which was thrown down, killing 10,000 Moors. Above half of the island of Madeira became waste; and even the island of Myteline, in the Archipelago, suffered so much from the shock that 2,000 houses were thrown down. This awful earthquake extended five thousand miles, even to Scotland. In England, various singular phenomena, unaccountable until the news of the earthquake arrived, were observed. The hot-well at Bristol became red as blood, and so thick and turbid that the water could not be drunk. Water in a common well turned as black as ink, and was unfit for use for a fortnight, and the tide of the river Avon turned back, contrary to its usual course. It was no wonder, therefore, that men's hearts failed them through fear, nor were the men of science able satisfactorily to account for the wonders which they beheld.

"On the morning of October 6, 1863, an earthquake was very sensibly felt all over England. At Rochester, Mr. Charles Dickens, sleeping in his house at Gads' Hill, felt it distinctly, and he describes it, as he tells everything, graphically and with power. He was 'awakened by a swaying of his bed from side to side, accompanied by a singular heaving motion. It was exactly as if some great beast had been asleep under the bedstead, and were now shaking itself, and trying to rise. No doors or windows rattled, though they rattle enough in windy weather; this house standing alone,' he writes, 'on a high ground in the neighborhood of two great rivers.'

"Des Cartes, Kircher, and others, supposed that in hollow and vast cavities, the womb of earth, waters and other exhalations arising from inflammable substances, such as niter, bitumen, and sulphur, met and forced a communication with each other; hence the shock and rising of portions of the earth. Lardner and Stukeley attributed them to electricity; and we have talked with many savans who still urge the electric theory, quoting in its cause the shock struck under the bottoms of ships, when out at sea, by the earthquake; but the former seems to be the more likely theory. It is well known that throughout the earth's surface there are vast volcanic areas. The Pacific contains some of these, of vast extent and intense energy, and is of itself the most magnificent volcanic basin in the world. At the head of the Red Sea, between the 15th and 16th parallels of N. lat., there is a volcanic region covering an area of 10,000 square miles, without interruption. Throughout all these areas, volcanoes and volcanic isles are still smoking and in action, carrying on the wondrous agencies of their Creator. From one of these, in 1834, from a crater of three miles in diameter, lava and smoke, fire and stones, were hurled seventy feet high in the air, hurried in fiery waves or precipitated down streams of liquid fire, over which the earth formed a burning arch, 'till the escape of gases,' says Mr. Douglas, 'met them and flung back the huge blocks of stone literally melted and spun into threads of glass, which were carried into the air like the refuse of a flax-mill. The noise,' says the narrator, 'could not be described—that of all the steam-engines in the world would be a whisper to it.'

"But though the mountains smoke and roar, and tuns upon tuns of incandescent matter are thrown out; though the vast Mediterranean is undermined by fire, which the cone of Etna and the mouths of Vesuvius throw up to the sky, the vents for this internal heat are not sufficient, and many places are subject to huge shakings, risings and upheavings of the surface rock or matter; and these are called earthquakes. They occur more frequently in autumn or winter than in spring or summer. The earthquakes occasion various motions, which differ on the ocean and on the land, and their progress also seems to vary. The Lisbon earthquake traveled to Barbadoes at a rate of a little more than seven miles a minute. The rolling sounds precede the occurrence of a huge oceanic wave which is thrown on the shore; and in the year 1854, when the town of Jeddo was engulfed, a Russian frigate was wrecked by the tremendous waves which repeatedly rolled over it.

"In 1840, at Mount Ararat, 3137 houses were thrown down, and many hundreds of people perished; at Zante, in the same year, many were killed from the same cause; at Cape Haytien, St. Domingo, in 1842, two-thirds of the town were thrown down, and between 4,000 and 5,000 people killed. In 1857, in Calabria, Montemarro and other towns were destroyed, and it is said that 22,000 lives were lost in a few seconds; it is calculated that out of a population of six millions the unfortunate kingdom of Naples lost in seventy five years 111,000 inhabitants. Nearly the last great earthquake recorded is no later than March 20, 1861, when the city of Mendoza in South America was overthrown, two-thirds of it destroyed, and 7,000 lives were lost! There was also a terrible one in Manilla during last year."

Analysis of the Bread found at Pompeii.

On the subject of the bread found at Pompeii M. de Luca has recently addressed two papers to the Academy of Sciences, which are not devoid of interest. The eighty-one loaves discovered at Pompeii on the 9th of August, 1862, in a Roman baking oven, he tells us, have not all been taken to the museum at Naples, where only a dozen are kept; the remainder are exhibited at Pompeii. They weigh from 500 to 600 grammes each, except four weighing 200 grammes more, and one of 1,204 grammes. Their form has been too often described to deserve repetition here; but their color and substance offer some interesting peculiarities. Externally the color is dark-brown, nearly black at the circumference, but lighter toward the center. The crust is somewhat hard and compact, but the crumb, which is porous, may be easily crushed between the forefinger and thumb, and has a luster not unlike that of coal. This crumb contains at the center about 23 per cent of water, while the part adjacent to the crust only contains from 13 to 21 per cent. It loses some of its humidity when exposed to the air and the weather is hot. The crumb near the crust contains 2 8 per cent of nitrogen; the crumb at the center only contains 2 6. The crust does not contain more than 1 65 per cent. The composition of this bread was not easy to ascertain, because the quantity of carbon diminishes from the circumference to the center, while the hydrogen, on the contrary, increases toward the center. This shows that the external air has exercised some action on the bread, notwithstanding it was enveloped in a baking oven. The corn found in the baking establishment of Pompeii seems to have been wheat of good quality; it is now of a dark-brown color, porous, and easy to crush between the forefinger and thumb. It contains 11·2 of ashes, 68·9 of carbon and 5.5 of oxygen, against 23·1 of ashes, 46 of carbon and 43 of oxygen, contained in wheat gathered in 1836. The proportion of hydrogen and nitrogen is about the same in both cases. But the corn of Pompeii has lost its starch, since it is not colored by iodine; nor does it contain any substance capable of reducing the tartrate of copper and potash, or fermenting with yeast. Hence, after eighteen centuries the corn of Pompeii has lost all its organic substances, and contains neither gluten nor starch, nor sugar, nor any fatty substance; while the bread contains the elements which constitute organic matter more toward the center than at the surface.—*Galignani.*

Silvering Glass.

The recent employment of silvered glass for the reflectors of telescopes having caused attention to be directed to this subject, many endeavors have been made to simplify the somewhat complicated operations. The following method, described in the London *Photographic News*, is more full than any that we have before seen. The solutions employed are four in number and they require some care in their first preparation; but once made they are always ready, and can be used with great rapidity and certainty for depositing a lustrous, mirror-like surface of silver on a piece of glass of any desired shape or curvature :—

Solution 1 is prepared by dissolving 1 part, by weight, of nitrate of silver in 10 parts of distilled water.

Solution 2 consists of an aqueous solution of pure ammonia, having a density of 13° Cartier.

Solution 3 consists of 4 parts of pure caustic soda in 100 of distilled water.

Solution 4 is made by dissolving 12½ parts of the best white loaf sugar in 100 parts of distilled water. To this add 1 part, by measure, of nitric acid, boil for twenty minutes, in order to alter the molecular arrangement of the particles of the sugar, and then add water to increase the volume to 500 parts by measure, and finally add 50 parts of alcohol.

These solutions will remain unchanged for a long time. When required for use, prepare an argentiferous liquid by pouring into a flask 12 parts, by measure, of the silver solution, No. 1; 8 parts, by measure, of the ammoniacal solution, No. 2; then 20 parts of the soda solution, No. 3; and, lastly, add 60 parts of distilled water, in order to make up the volume to 100.

If the proportions have been properly observed, the liquid so prepared will be perfectly clear, but will be rendered turbid by the smallest addition of nitrate of silver solution. It must be allowed to remain without disturbance for twenty-four hours, to permit the floating particles to settle. The clear liquid decanted from the sediment will then be ready for use.

The surface of the glass which has to be silvered must be well cleaned with a tuft of cotton and a few drops of nitric acid, and then washed with distilled water. Drain it, and support it on the surface of the silvering bath, which is composed of the above-described argentiferous liquid, with the addition of $\frac{1}{10}$th or $\frac{1}{12}$th by volume of the sugar solution, No. 4. The surface to be silvered should, by preference, be at the upper part of the liquid, so that the silver may be deposited on it from below upward. There are two advantages in this—first, the deposit is finer and more even: and, second, there is no danger of floating particles of dust settling on the surface. It is, however, scarcely necessary to say that silver will be deposited upon every part of the glass which is under the surface of the liquid, as well as upon the sides and bottom of the vessel; so that, as a matter of economy, as little as possible of the back of the glass should be exposed to the action of the liquid. The action seems to be somewhat of a photographic character, being more rapid in the light than in darkness. Under the influence of diffused light the liquid becomes yellow, then brown, and in a few minutes the whole of the exposed surface of the glass will be covered with a fine deposit of silver. In about a quarter of an hour the thickness of the metallic coating will be sufficient to bear the subsequent operations without injury; it must then be washed with plenty of water, and rested by one corner on several thicknesses of blotting-paper to dry spontaneously. The surface will now be covered with a thin whitish veil, which may be readily removed by gentle friction with chamois leather; it may afterwards be polished with jewelers' rouge, when a perfectly brilliant surface will be produced.

THE iron foundery at Selma, Ala., is actively engaged in the casting of guns, from 6-pounders to those of 10-inch bore. About three are cast per day. A large majority of them, however, burst upon testing. Few can be fired over six or eight times with safety.

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Improved Lawn Mower.

The object of the invention herewith illustrated is to provide a machine which will trim a lawn or cut grass in small quantities in a much better and more expeditious manner than it has been done heretofore. The machine is peculiar in construction, as the motive power by which the cutters are worked is not obtained from traction wheels, as is generally the case with tools of this class, but is wholly independent of and not confined to the locomotive apparatus, as will be seen by referring to the engraving. This principle of the machine is beneficial in many respects, as it enables the person using it to work close up to trees, shrubs and bushes, without danger of injuring them, and also in that the machine does not require to be so heavy as it would if traction wheels were employed to move the cutter bar; this is also a desirable point to obtain where the labor of working or pushing the mower over the ground has to be performed by the operator.

FISHER'S HAND LAWN-MOWER.

The plan and construction of the apparatus is as follows:—The cutter bar, A, has the cutters, B, or fingers, as they are sometimes called, working between them in the usual manner. This bar is fastened to a pair of small wheels, C, and has also a roller, D, at the forward side where it enters the grass to be cut. The guides, E, are merely to throw the cut grass inside of the wheels, so that it will not add to the labor required to move the machine. The cutters are worked by the gearing, F, operated by hand, as shown in the engraving. The crank, G, is attached to the pinion, I, and the rod, H, proceeds to a right-angled lever, one end of which is seen at J; the revolution of the pinion produces a rapid reciprocating movement of the cutting apparatus.

The machine can be altered to suit different individuals, or made to accommodate itself to persons of varying hight, by slacking off the bolt in the wheel and sliding the bar, K, up until the proper position is obtained. Thus it will be seen that by the aid of this machine a lawn can be neatly and rapidly trimmed, or small quantities of green fodder cut for animals in the most expeditious manner; the cutting apparatus is not clogged, as it would be if moved slowly by traction wheels, but the speed of the cutters and the efficiency of their work is at all times under control. This machine was patented through the Scientific American Patent Agency on May 5, 1863, by Henry Fisher, of Alliance, Ohio; for further information address him at that place. State, county and town rights for sale.

Greenbacks Turned into Gold.

This pleasing transmutation may be realized by any person on sending three one-dollar bills to this office in payment of a year's subscription to the Scientific American. In every art, trade or profession, the man who reads this journal is sure to derive great benefit. The knowledge which its pages convey will inform his mind, lighten his cares and help him to save time in the discharge of every duty; and "time is money." Our new volume commences January 1, 1864.

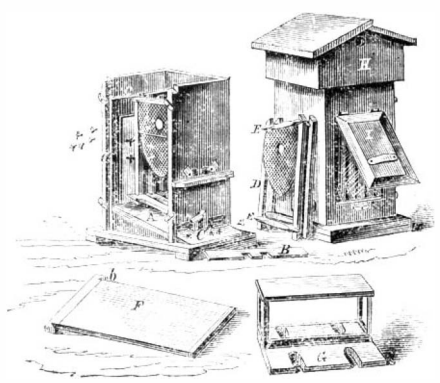
Oxygenated oil is prepared by transmitting a stream of chlorine gas through olive oil kept cold by being surrounded by ice for several days, then washing the oil with water.

Cost of Living.

In reference to high prices, *Thompson's Bank Note Reporter* says:—"The current opinion is that high prices are wholly the effect of the paper money expansion. This opinion is only about half correct. High prices are caused by several things. The increased product of the precious metals would of itself have sustained higher prices than formerly, if there had been no suspension of specie payments. Then, taxation is an elevating element; and the decreased amount of labor and the increased consumption aid the elevation of prices. While we admit that the paper money is partly (probably about one-half) the cause of the rise in prices, we earnestly contend that these other causes should have due consideration in the premises."

KING'S IMPROVED BEE-HIVE.

The culture of the honey-bee has engaged the attention of intelligent and enterprising men of all ages, yet within a few years, by the introduction of movable frames and other improvements for bee-



hives, old systems have been abandoned, former theories exploded, and bee-keeping rendered as certain and more remunerative, with less capital, than most other rural pursuits. The shape and construction of the old-fashioned hives were not suitable to the natural habits of the insects, and the difficulty in removing the frames, and liability of injuring the combs and bees, greatly impaired their utility. The hive which forms the subject of this illustration (being the result of long experience), is believed to be free from these objections, besides possessing many other advantages which render it valuable. In the engraving the inclined bottom board, A, projects in front of the hive for the bees to alight on. By the use of the small slide, B, held in place by a button, the entrance can be regulated to any desired size; and by making the notches in the slide correspond with the pillars, C, the entrance is closed entirely. The side bars of the movable comb frames, D (seen resting against the hive), have their lower ends beveled outwardly to a point resting on the bottom board, causing the frame to incline into the hive. The projections, E, on the top and bottom bars of the frame accomplish the two-fold purpose of keeping the frames at the proper distance from each other, and from the walls of the hive. The object of having the frames touch only on their points and edges is to leave no place within the hive where moths may deposit their eggs which cannot be reached by the bees. The movable side, F, is inserted from above into the rabbets, *a*, and is held up by the mitred clamp, *b*. By thus opening the hive at the side, the proprietor can remove the frames without liability of injuring the combs or bees in lifting them out at the top of the hive. The sides of the honey board, G, rest upon the rabbets, *c*, three inches below the top of the hive. These rabbets not only serve as a rest for the honey board, but allow it to swell without becoming tight, or to shrink without opening cracks in the hive. The rabbets extending down the side of the hive, obviate the same difficulties with regard to the movable portion. At the approach of winter the surplus honey boxes are removed and the deep notches in the ends of the honey board covered with wire cloth; the basin or cavity above the honey board is then filled with cut straw or shavings to absorb the moisture arising from the bees, thus keeping the interior of the hive dry and free from frost. A swarm thus prepared, in a hive having good depth of comb, with holes cut through them near the top for winter passages, will not perish while there is honey in the hive. The roof-shaped cap, H, is made large enough to fit over the hive and is supported by strips fastened upon the inside; and it is easily removed without jar. The hive is ventilated from the air-chamber below the bottom board, by a channel (not shown in the engraving), covered with wire gauze, so placed as not to be coated over by the bees and yet admit air without light into the hive, through the lower hole in the flap, I. By means of this device bees may be swarmed on the nucleus system (fully explained in a work by the inventor, price 25 cents), securing to the new swarm a fertile queen, and scarcely interrupting the labors of the parent stock. This hive was patented through the Scientific American Patent Agency, Nov. 24, 1863 (see claims in another column); for further particulars address the patentees, H. A. King & Bro's, Nevada, Ohio, or A. J. King, San Jose, Cal.

Parson Brownlow.—C. S. Hubbard, of New Haven, Conn., is making large remittances to the Parson in a manner to avoid risk of loss by mail. Parties wishing to procure the *Knoxville Whig and Rebel Ventilator* ($2 per year, in advance), will do well to send through Mr. Hubbard's hands.

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VOL. IX, NO. 24...[NEW SERIES.].....*Nineteenth Year.*

NEW YORK, SATURDAY, DECEMBER 12, 1863.

OUR NEW DRESS.

With the commencement of the new volume on the 1st of January next, we shall present the SCIENTIFIC AMERICAN, which has now attained its eighteenth year, in a new and handsome dress—one, we trust, that will become its age and character. Though we are growing old and somewhat *gray* in the service, we have still vigor and determination enough left to make us desire that our next volume should be by far the best yet issued. We shall continue to trim the midnight lamp, if necessary, in order that we may keep the standard of the SCIENTIFIC AMERICAN up to any former period in its history. We believe that no other journal ever published has had truer or better friends than ours; and we again appeal to them to aid us in promoting its more widespread circulation. We do not depend upon agents; we prefer to rely upon the good words and deeds of our friends, and upon the well-established character of our journal, to increase its circulation. Friends! lend us a little of your valuable time in increasing our subscription list, and we will endeavor to more than repay you by making it still more worthy of your confidence and support.

ON THE VALUE OF SMALL PATENTS.

There are a great many persons brought more or less in contact with the novelties and inventions of the day, who have heard the remark, "What a simple thing; anybody could have invented that!" Exactly; a truer criticism was never passed. It was not so much the nature of the invention, perhaps, as the shrewdness of the individual who introduced it and foresaw the advantages likely to accrue to him in a pecuniary point of view. If any one had told the inventor of the metallic-tipped shoe for children that his simple idea was worth hundreds of thousands of dollars, he would himself have thought the prophet a little too sanguine. Or to take a higher class of invention, no one could possibly foresee the tremendous trade which has sprung into existence from the sewing-machine; what an almost endless category of small articles or appliances, such as hemmers, fellers, quilters, button-hole machines, loop-checks, needles, shuttles, &c., have been, and are daily invented and brought out as indispensable additions to the greatest of all modern inventions! It is a mystery to us what becomes of all the sewing-machines; one firm, we are told, turns out 600 per week, and besides this company there are half a dozen others of nearly equal capacity urging their shops to the utmost.

The office or object of the inventor is of course to make money, but if he achieve the double task of lightening labor and amassing wealth, his calling is so much the more to be honored. There is no question but that those who improve the character of the simple articles in use in every household, or substitute newer and more ingenious appliances for doing hard work anywhere, have a sure prospect ahead of a most alluring nature. No investment is equal to a good invention of a popular kind, and none so quickly returns the discoverer an hundredfold for his outlay of time and study. Look about you, young men, and though you may not discover "sermons in stones," or "books in the running brooks," you will find "good in everything," and chances for wealth you little dreamed of. Of the inventions relating to kerosene lamps, it is calculated that upwards of 400 patents have been issued, and the number increases; this proves that there is or has been an immense field in that direction; which many parties, to our knowledge have worked successfully and reaped fortunes thereby. What is true of this line of invention is equally so with reference to others; let those who wish to obtain a fair remuneration for their time and services turn their attention to the daily avocations of life, and improve the tools, instruments, utensils, and what not, employed in them, and they will have no reason to regret it; unless, indeed, after having once devoted time and attention to a good idea, they lay it on one side till a more convenient season, supposing that the world is going to wait their convenience for the improvement. Such a course is a mistaken one. Repeatedly we have heard parties say, "What! is that patented? I have just such a model at home now;" and then when it is too late of course they go to work with intense zeal to bring out their invention. "Delays are dangerous;" it is an old proverb, but a true one.

Reader, if you have an idea respecting an invention, do not hesitate, but bring it before the public at once. An idea in the shape of a useful patented article is thousands of dollars locked up in idleness which might be turned to good account. See to it, that in your case, at least, no halting, indecisive, half-way policy prevents you from obtaining a reward for your outlay of time and money.

THE MACHINIST'S STRIKE.

Up to this time the disagreement in regard to prices between the machinists and their employers prevails in full force. No men are at work in the large shops, such as the Allaire, Novelty, Morgan, Murphy, Delamater, Neptune, Etna, and Secor Iron Works. These are the principal firms, employing upon an average about 300 machinists each. The attitude of the employers upon the question is unchanged; they declare that the wages of the men have already been raised 48 per cent (not cents) since the increased rate of living prevailed, and that it is utterly impossible for them to advance the mass to any greater amount. They also say that their contracts do not admit of a further increase, and that it would be more politic for them to close their works than to accede to the demands of their operatives. Upon the other hand the workmen aver that they find it impossible to live with their present remuneration, and that while the wages have been increased in a great many cases, to the sums stated, the mass of them receive but little more than before the war; and at the best not so much as boiler-makers and members of other branches or trades employed in common with them upon steam engine work, and not considered so high in standing (as mechanics) as machinists are.

The men assert their unwillingness to go to work at the old prices, and declare that they will carry their labor to other markets before they will submit. We have no comments to make upon this condition of affairs. To us it is most melancholy. It was stated to us in two of the principal shops that the pay roll had fallen off about $1200 per week since the strike; if this be taken as the average throughout the principal establishments in the city, for the three weeks now ended in which the strike has been maintained, the workmen are some $300,000 out of pocket. The winter approaches, and soon the cold weather will be felt in all its severity; with coal at $11 per tun, it seems well to take counsel for the future and look forward to the probable results ensuing from idleness. Not only this, but our machinists, than whom there is no class more loyal or patriotic, must see that the interests of the country suffer greatly by their action; and they will, we hope, reconsider the matter and see if some understanding cannot be arrived at whereby all parties will be suited.

FRENCH architects are making a great fuss over an iron building recently erected in Rue St. Honoré, Paris; it is a nine-days' wonder to them.

THE FOREIGN IRON-CLADS.

Let those restless individuals, over whom the terrors of foreign intervention still hang threateningly, possess their souls in peace; the best possible proof of pacific intention is the absence of any power to harm. The lumbering old iron-clads of England, and the unwieldy carcasses, denominated frigates, of France, are good examples of old-fogyism as applied in the construction of national defenses. If we are to wait until these monstrous inventions arrive upon our coast, we may put off the evil day of foreign war for a very long time.

Paragraphs shadowing forth the progress or rather degree of incompleteness to which the vessels have arrived, have been placed before our readers, and it would be but a tedious recapitulation to enumerate them here. Suffice it to say that, following hard upon the echoes of the battle between the *Monitor* and *Merrimac*, in Hampton Roads, the English government fell to work with renewed energy upon some iron-clad ships long held in contemplation, and one of which, the *Warrior*, they had already completed. With that obstinacy of purpose which distinguishes both the individual and the nation, they turned out of their dockyards the *Defense*, the *Black Prince*, the *Prince Consort*, the *Resolute*, and, quite recently, the *Valiant*. All of these ships are of the high-out-of-water style of marine architecture. They have cumbrous spars and rigging; the glorious old tumble-home sides which jolly tars delight in, and uncouth bows and sterns. They require a wide field and great favor to maneuver in; so much so that were one of them to "wear ship" in an engagement, or require to turn, her adversary would think she had given up the battle in disgust and gone home; for no less than three miles is demanded by some of them to make a complete circle in! Excellent iron-clads! royal old ships! with four and five-inch iron plating, through which a Parrott shot flies like a bullet through brown paper—through which even the now much-despised Dahlgren eleven inch shot, with a charge of thirty pounds, and a range of something like eighty yards, tears its way like a marlin-spike through a twist of oakum.

They have other virtues, too: they belong to the sea; they have a hold upon it—a strong lien. They cling to the deep with a tenacity hitherto unreached by any other iron-clads afloat—they cannot be upset. Not they! Twenty-six and twenty-eight feet of water lies between the keel and the water line; and this, and more, must be the depth of every harbor and channel they visit, or else the ship goes aground. One would think that, with this draft, the vessels would be weatherly, and not roll; but they heave prodigiously upon the troubled sea. If accounts of recent English papers may be believed they almost throw their masts overboard! Clever ships for a pleasure voyage! Charming specimens of the mechanical talent and skill of the bold Britons. Some of them have Captain Coles's turrets, as he calls them, but which are, in reality, heavy iron shields of great thickness, backed up with the universal teak-wood (like unto which there is none other in John's opinion), and operated by machinery as delicate, compared with the duty required of it, as watch-work. In these there are some weapons known as Armstrong guns, and 68-pounders or 8-inch guns—very bad things to get in front of; principally used heretofore in India to blow Sepoys into atoms with.

Mr. Laird, M. P., whose conscience allows him to build *Alabamas* and *Floridas*, says that there are only two vessels fit for harbor defense in England; the Coles's ships draw too much water for that purpose, and yet are not able to cross the ocean. Here is a quandary, indeed.

The London *Examiner* says the Armstrong gun can't knock an old duck off its nest, and other papers vent even worse abuse upon the head of the devoted inventor. Between the iron-clads that won't sail and cannot cross the ocean, and the "long range" Armstrong guns, the national defenses of England would seem to require a little attention.

If the reader ask how much has all this cost the bold Britons, we answer, only $150,000,000! The scrap-iron trade of England will be enormously valuable a few years from the present time.

France is no better off. The Emperor has a lot of old tubs he calls "ships of the line." The *Nor-*

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mandie, the *Couronne*, the *Gloire*, the *Magenta* and *Solferino*, are some of the names which dignify these children of the sea. They had a trial trip recently and Neptune was so indignant at the affront put upon him by the presence of such craft, that he tossed them, battered them, beat and bruised them so sorely that they were glad to find refuge in Brest—a French naval station. They were totally unfit for sea-going purposes, as indeed all vessels of that class are.

The iron clad navy of this country is composed at present of monitor vessels of varying tunnage. There will be launched within a few days one of the new ocean monitors—the *Dictator*; and there is every reason to assert that she will be a success as regards sea-going qualities; speed she will certainly possess. It is not too much to assert that no iron-clad ship can hope to weather a gale as easily as a wooden vessel; the lack of buoyancy or "life," so to speak, and the unwieldiness which attaches in a degree to all of them, militates against obtaining the best qualities of wooden vessels. But it is not unreasonable to declare that with the absence of the extensive overhang forward and aft, the projecting side-armor and favorable models, the two ships, *Puritan* and *Dictator*, will carry the flag of the Union in triumph over every obstacle, national and physical. Their well-known qualities for offense and defense—the turrets, heavy armor, guns, and comparatively light draft—render them most formidable adversaries; while the depth to which they are submerged, or, rather, the small portion visible above water, leaves nothing to be attacked that is vulnerable.

So far the monitors have been comparatively uninjured. They have been raised out of the water by torpedoes and have gone on with their duty unharmed; they have resisted showers of shot and shell which would have sunk the whole English and French fleets, if exposed at the same range, and in a few hours have resumed their duty. The Parrott guns have carried further than five miles; they sent tidings of their prowess unto the governments of all Europe belligerently disposed toward us. What is the consequence? Napoleon is complacent; it is said he has seized the French rams building for the rebels: Palmerston and Russell are benignant; they detain the rebel iron-clads. Why? The nation which makes Parrott guns and builds "iron-clads that are iron-clads" is not one to be despised, but to be placated, to be flattered, to be friendly with; consequently we are to have no foreign war, and the rebellion is to be crushed.

THE UTILITY OF INVENTORS TO MANKIND.

When Fulton first movedaway from the dock with the *Clermont*, the skeptical crowd who watched his success doubted the evidence of their own eyes, but at length broke out in unrestrained applause at his triumph; which in that age of the arts and sciences was great indeed. From that day until the present time the efforts of mankind have been put forth to accomplish the hard work of the world by sinews that never tire. Apt indeed are the automatons which now clothe the naked, feed the hungry, shelter the houseless, and whirl the traveler at a giddy speed over plains or seas. All the steam engines have been perfected only by patient effort, mental and bodily; all the looms run themselves, so to speak, only by reason of the intelligent and untiring exertions made by practical men; and cheap clothing, cheap traveling, cheap food, cheap everything, in fact, results from the introduction of useful machines.

Inventors have been, and are still busy; let them be still more active. Fame writes the names of successful ones high up on her scroll, and the cause of humanity, of mercy, of all virtues and qualities, is aided and countenanced by the art of invention. As witness the safety-lamp of Sir Humphrey Davy, and the circulation of the blood by Jenner; for this latter, although more properly a discovery, was yet the result of patient thought and investigation. In more modern times the name of Morse, as connected with the telegraph; of Parrott, associated with his rifled ordnance, of Timby as the originator, and Ericsson as the practical developer of the system of iron-clad batteries, will all be gratefully remembered by posterity as men who by their talent, energy, and patriotism, achieved great results for the nation.

With such a record before him, let no aspiring young man waste time and money on perpetual motions or other whirligigs, which are to the art of useful invention what the philosopher's stone is to chemistry—the shadowy and illusive thing that evades every attempt to grasp it, and ends only in sorrow and inexpressible misery to all concerned. Take hold of realities, oh! ye who aspire to wealth and honor! Grasp not the wind, but seize upon some arduous task now performed by manual labor, and reduce it to the sphere of machinery. Wrestle with possibilities, not intangible things; and fame and fortune, which now seem afar off, shall come at your nod and beck, as the slaves of old obeyed the rubbing of Aladdin's ring.

VINEGAR AND ITS ADULTERATIONS.

Cider vinegar has always been preferred by our people on account of its wholesome properties; and at one period a sufficient quantity of it was manufactured to supply the public demand. This is not now the case, as most of the vinegar which is at present consumed in cities is made from high wines (whiskies) and molasses. Vinegar may be made by several different processes and from a great number of substances It is made from apple juice by the slow process of fermentation, but from high wines or liquids containing alcohol it is manufactured by a quick process, consisting of exposing warm high wines mixed with water to the atmosphere, while passing in thin streamlets over a very extended surface of beech-wood shavings. By this mode of operating, the alcohol combines chemically with a certain quantity of oxygen and forms acetic acid-vinegar. This is the system which is now most extensively followed in vinegar manufactories. Any substance which contains sugar may be converted, by fermentation, into alcohol and finally into acetic acid. At present, when high wines and substances containing sugar, such as molasses, are so high in price, possibly the vinegar which is made from these may be adulterated by sulphuric acid, before it reaches the purchaser. It is well known that when the price of any article becomes high, adulteration is practiced to a much larger extent with it, because the addition of a small quantity of a cheap foreign substance largely increases the profits. As a small quantity of sulphuric acid added to vinegar permits the use of a large quantity of water, this acid has been frequently and extensively used for adulteration. It has been asserted by manufacturers of vinegar that as the acetic acid made from weak wines, beer, malt, and molasses, was liable to putrid fermentation and decomposition, some sulphuric acid was necessary to counteract this tendency and prevent it from becoming turbid and vapid. The least quantity employed for this purpose was about one gallon to one thousand gallons of vinegar. But when the manufacture of vinegar is properly conducted there is no necessity for adding any sulphuric acid. The mode of detecting such acid in vinegar is described by Dr. Muspratt as follows:—"If the vinegar be suspected to contain a considerable quantity of sulphuric acid, make a solution of sugar and heat it to 200° Fah.; if a drop of the suspected vinegar is added to this, it will carbonize the sugar, causing a blackish spot to appear at the point where the vinegar came into contact with the saccharine solution. This happens when the vinegar contains one-three-hundredth of its weight of sulphuric acid; when it contains from six-hundredths to eight-hundredths of its weight of this acid, it produces a greenish spot in the solution." But the principal test for this acid in vinegar is the use of a soluble salt of baryta, such as the chloride. When this is added to vinegar containing sulphuric acid, insoluble sulphate is produced, which falls down in a heavy white powder. Moderate quantities of good vinegar are beneficial in assisting digestion, but sulphuric acid does not favor digestion, and when taken in considerable quantities it injures the coating of the stomach. In every sense then, sulphuric acid is an injurious adulteration of vinegar and should not be permitted. Hydrochloric and nitric acids have also been employed for adulteration, but to such a limited extent that they do not invite public attention.

Vinegar made from pure alcohol and water does not possess the flavor of wine or cider vinegar, and is therefore inferior to them for table use; but a little acetic ether added to it renders it agreeable. Raw spirits containing some fusel oil produce a more pleasantly-flavored vinegar than refined spirits; hence a few drops of fusel oil added to rectified spirits, in making the wash for vinegar, improves its aroma. A little oil of cloves, or butyric ether added in the same manner improves its flavor. A very small quantity of cider vinegar gives a large quantity of whisky vinegar a pleasant flavor. An infusion of chicory is sometimes added to high wine vinegar, to give it the color of cider vinegar. Fancy or aromatic vinegars are sometimes used for the toilet, for fumigation and table use. A good aromatic vinegar is made by macerating cloves, rosemary, sage, nutmegs, caraway, peppermint, cinnamon and calamus, each one ounce, in two gallons of strong vinegar, adding a little tincture of camphor. In fact any of the essential oils, such as those of cloves, bergamot, lavender, &c., added to vinegar render it aromatic.

Uniform of Naval Engineers.

The following list will, if borne in mind, enable our readers to tell the rank of their engineering friends at a glance;—

Chief of Bureau of Steam Engineering.—Center device, cross oak leaf, one inch long, embroidered in gold, with star seven eighths of an inch in diameter embroidered on the same, in silver.

Fleet Engineers and Chief Engineers after Fifteen Years.—Spread eagle, two inches between the tips of the wings, standing on oak leaves spread one inch and a quarter, all embroidered in silver in center of strap.

Chief Engineers after first Five Years.—Center device, cross-spread oak leaf, with leaf at each end five-eighths of an inch in length, stalk of leaf placed three-eighths of an inch from end of strap; all embroidered in silver.

Chief Engineers first Five Years.—Same as chief engineer after first five years, except leaves at the end to be embroidered in gold.

First Assistant Engineers.—Same as chief engineers, except that instead of the leaves there shall be one gold embroidered bar at each end, two-tenths of an inch wide, half an inch long, and placed four-tenths of an inch from the end of strap.

Second Assistant Engineers.—Same as first assistant, but no bars.

Our Sons Need Good Reading.

"I wish that my son had more of a taste for useful reading and study." Such is the father's frequent thought and observation. To interest their children in things that are beneficial, thus to save them from bad company and pernicious habits, is the constant aim of every true parent. One excellent means to this end consists in making the Scientific American a regular visitor at your dwelling. Let it be in sight on your book-case or table, and notice how quickly it attracts the young. Its pages are full of the most interesting, varied and useful information, the study of which insensibly excites the mind with a desire for more; and this desire, once fairly kindled, endures through life, expanding and ennobling the intellect. January 1, 1864, commences a new volume of the Scientific American: subscribe for your son, if not for yourself.

English Cutlery for the Rebels.

A large amount of cutlery in the shape of pocket knives and small wares of a similar nature has been, and possibly still is, manufactured in England for the rebel firm of Courtney & Tennant, of Charleston. Some of it was found on board the *Bermuda*, said vessel having been captured while attempting to run the blockade; one specimen is thus spoken of:—"On the large blade is an excellent likeness of Jeff. Davis, above which is the inscription, 'The Right Man in the Right Place,' and below, 'Jeff Davis Our First President.' The knife might have cost three shillings in England, but in the South it would have sold readily for as many dollars; a fact which goes to show in a small way the enormous profits to be made by running the blockade.'"

[In view of recent events some persons might be disposed to question the correctness of the inscription on the blade—the makers probably meant "the right man in a *tight* place.'"

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INVENTIONS AND DISCOVERIES ABROAD.

Reeling Silk from Cocoons.—As silk manufactories are now beginning to grow and prosper in our country, every improvement relating to such manufactures is of considerable importance to our people. A. Keller, of Zurich, Switzerland, has taken out a patent for an improved method of reeling silk from cocoons upon bobbins. The apparatus is arranged to reel with six sets of cocoons at the same time. The cocoons are placed in a bath containing water kept warm by steam heat. The desired number of filaments of silk from as many cocoons, are united together by the apparatus as the filaments rise toward a reel, on which they are wound in such a manner as to take some turns on the reel, and at the same time these filaments are also given off from the reel to a cylinder, which is either of less diameter than the reel, or moves more slowly, so as to allow the filaments to shrink before they are wound on the bobbin. The cylinder is placed in a case which is supplied with heated dry air, and the bobbin upon which the silk is wound is in surface contact with the cylinder, and caused to rotate by it, so that the silk is thus run off the cocoon upon the spools dry at one continuous operation.

Transferring Prints, Designs, &c.—A patent has been applied for by J. B. M. A. Bourreiff, of Paris, for transferring designs in colors or otherwise, to other surfaces. The inventor takes sized, unsized, or half-sized paper, and gives it first one or more coats of the following preparation:—Gum arabic dissolved in water, tapioca, sago, starch, or other fecula mixed in hot water, or boiled in water, and the whole well mixed and stirred. The preparation may be varied so long as similar sticking properties are preserved. After the coating it is better to glaze the paper. This aids the transfer of the impression to be made on the coating. The typographic impression is taken in the ordinary manner, but in lieu of ordinary printing ink he uses a mordant or strong varnish, in which it is better, with the view of obtaining more intense color, where color enters into the design, to incorporate or mix a quantity of the desired color with the varnish. The form or block is covered or "inked" by a roller with the varnish, and a print, on the coated paper, is taken directly after the printing; or before the ink becomes dry, he powders it over with the same color, by means of a puff, soft brush, or other like article. This operation should be performed at every change of color. When all the coloring matter for the print is dry, he cleanses it by a feather or other like soft article drawn over it. When the paper has received all the colors or gold entering into the design, it is as well —though not absolutely necessary—to pass the paper through rolls, to give a glaze, and to impart homogeneity to the colors and the gold. To transfer the impression to the surface for receiving it, he applies, an hour or more before using the impression, both to it and to the surface to which it is to be transferred, a liquid, composed of essence of turpentine, and one-half part of colophony. He then applies the print to the surface, and uses a roller or rubs with the palm of the hand or otherwise to ensure contact of every part of the impression. He afterward wets or moistens the paper, and separates or draws off the paper from the impression, when the design alone will adhere to the surface to which it has been transferred. For articles subjected to firing after the transfer of the design to them, the colors used must be mineral, and not vegetable, and should be such as are employed by painters on porcelain, china, and glass.

Purifying Coal Gas.—A patent has been taken out by Isaac Baggs and William Simpson, London, for purifying coal gas to deprive it of sulphur, &c. The gas is passed through a solution of the sulphate of copper, which decomposes any sulphuretted hydrogen that may be in it, and forms a sulphide of copper which may be used to produce sulphate of copper, and thus perform the same office a great number of times. For this purpose the sulphide of copper is roasted with access to the air, which results in producing the sulphate of copper. To abstract the carbonic acid from coal gas, the latter is made to pass through water containing metallic oxide in suspension; oxide of zinc, copper, or other metal, will answer the purpose. When the oxide is saturated with gas, the latter is drawn off, and the oxide recovered by exposing the carbonate so produced to a red heat. Another means of effecting depuration of the gases is by exposing the cleansing material above named and referred to, in a state of powder, formed into a porous mass by the addition of pumice stone, the gas being caused to permeate or filter through the mass.

Treatment of Cast-iron.—R. Mushet, of Coleford, England, has taken out a patent for mixing and combining with pig iron, intended for castings, a quantity of semi-steel or malleable iron, obtained by the pneumatic (Bessemer) process, for the purpose of improving the quality of castings, to render them superior for making articles such as shafts, guns, &c., designed to withstand great strains.

Rollers for Spinning Cotton.—In the roller drawing frame employed in spinning cotton, a small fluted metal roller is employed under and in conjunction with another roller covered with leather, and the sliver of cotton is drawn between them. The smooth roller soon becomes indented by the fluted one and imperfect work is executed. To obviate the use of a fluted drawing roller, I. Leach and J. Anderson, of Ashton-under-Lyne, England, have taken out a patent for the use of smooth front bottom rollers. They state that fluted rollers have hitherto been considered indispensable for this purpose, but they find that smooth bottom rollers produce a better quality of yarn, and the leather-top rollers are not injured by them.

Bleaching Jute Fibre.—Jute or Indian hemp, owing to its low price, is being applied to the manufacture of many textile fabrics for which cotton was formerly used. G. Stewart, of Glasgow, Scotland, has taken out a patent for bleaching jute by immersing it several times in solutions of the chloride of soda, then in dilute sulphuric acid, after which it is thoroughly washed and dried. The chloride of potash was employed for bleaching cotton and linen before the chloride of lime—the common bleaching agent—was adopted. The latter took the place of the former simply because it is much cheaper, and it is also cheaper than chloride of soda.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list:—

Water Wheel.—This invention relates to an improved water wheel of that class which are placed in vertical shafts and inclosed within a case. The object of the invention is to obtain a wheel of the class specified which will admit of the water acting upon it both by impact and gravity, and at the same time render the wheel capable of being favorably driven under the disadvantage of back-water and without the employment of flumes or spouts to conduct the water to the wheel, and by which a considerable loss of power is caused by friction. The invention having further for its object the application of a plurality of gates to regulate the introduction of water to the wheel as occasion may require. G. W. White, of Monroeton, Pa., is the inventor of this wheel.

Gun Turrets.—The object of this invention is to dispense with the use of bolts in the gun turrets, pilot houses, and other parts of vessels-of-war or fortifications which are constructed of iron; and to this end it consists in constructing such turrets of two or more series of plates or slabs united by means of dovetail tongues and grooves, so arranged that the faces of the dovetails and backs of the grooves are presented toward the exterior and interior of the structure, and in such a direction that the impact of projectiles striking full upon the structure is prevented from operating upon the dovetails in a lateral direction and thereby be liable to fracture them with comparative facility. George Snedecor, of 10 Walker street, New York city, is the inventor of this improvement.

Fusible Plug.—The safety plugs in common use are very unreliable after having been in use for some time. When composed of an alloy the particles of the different metals have a galvanic action, which will, in time, infallibly remove the more fusible metal, and when the water in contact with them is not very pure, the metal, thus removed, is replaced by a stony deposit from the water, and the plug is worse than useless because it lulls all suspicion of danger, and moreover the film of oxide, which is formed upon it at first, and is commonly relied on to protect it from further corrosion, is only proof that destruction has begun. The objection to a plug of lead or any single metal which has been sometimes used is that it does not melt at a sufficiently low temperature for safety in most cases. The object of this invention is to obviate all these dangers, and to this end it consists in protecting a fusible safety plug by any known process, with a coating of a metal less fusible and less liable to corrode than the metal or alloy of which the body of the plug is composed, but so thin as to offer no appreciable resistance to pressure when the metal or alloy of which the body is composed, is softened or melted by heat. F. Curtis, of Newburyport, Mass., is the inventor of this improvement.

Expanding Tompion for Ordnance.—This invention relates to the expanding packing of the tompion. This packing has been heretofore made of vulcanized india-rubber or other gum, and the free sulphur which remains in the gum after vulcanization has produced the corrosion of the interior of the muzzle of the piece to which it has been applied. The object of my improvement is to prevent this effect, and it consists in the application to the vulcanized gum packing of a covering of chamois or other leather, cloth, felt, velvet, plush or other suitable material, which is neither sticky nor contains any of the elements by which the corrosion of metal can be produced, and in the interposition between the vulcanized gum and the said covering, of unvulcanized india-rubber or other material possessing a similar quality of being impervious to sulphur. George R. Willmot, of Meriden, Conn., is the inventor of this improvement.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING NOVEMBER 24, 1863.

Reported Officially for the Scientific American.

*** Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

40,670.—Grain Separator.—Cyrus Bates, Hardin, Iowa:

I claim the adjustable screen, D, with the board or plate, E, attached and placed in the shoe, C, in combination with the screen, F, provided with the trap-door, G, all arranged to operate substantially as and for the purpose herein set forth.

[The object of this invention is to obtain a suitable and efficient device for separating impurities from grain, and also to separate the largest and soundest particles of grain from the inferior portions, as well as to separate one kind of grain from another.]

40,671.—Elevator Bucket.—John S. Brooks, Rochester, N. Y.:

I claim the combination of cast metal ends or heads with sheet metal front and back, in elevator buckets, as and for the purposes shown and described.

40,672.—Mode of protecting Ships' Bottoms.—James Brown, Aldgate, London, England:

I claim the covering of the bottoms and sides of ships or other partially or entirely submerged surfaces with glazed or enameled plates of iron, and applied in the manner and for the purpose above described.

40,673.—Lubricator.—Hugh Campbell, Newtown, Conn.:

I claim a grease or tallow cup fitted with a movable cover and a steam pipe, and constructed and arranged substantially in the manner described for the purpose specified.

40,674.—Corkscrew.—Charles Chinnock, Brooklyn (E.D.), N. Y.:

I claim the case or tube, A, provided with the slots, a b, in connection with the slide, B, provided with a pin, c, fitted in the slot, a, of the case and the corkscrew, C, or other tool attached to the slide by a joint, f, substantially as herein set forth.

[The object of this invention is to construct a corkscrew, gimlet, screwdriver, or other tool which is turned in using it, in such a manner that its handle will serve as a case to receive the tool when not in use, and render the same capable of being carried in the pocket without any inconvenience, and, at the same time, be capable of being manufactured at a small cost and without having any of its parts detachable.]

40,675.—Harvester.—I. H. Coller, Poughkeepsie, N.Y.:

I claim, first, The combination of the rigid finger bar, D E, hinged slide, C, and guides, E K, the whole constructed and operating substantially as herein described.

Second, The slide, C, with its box, B, when the slide is hinged to the finger beam or shoe, by means of links, H, and a bolt, I, substantially as herein described.

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Third, The combination of the slide, C, rigid finger bar, D E, shoe, F, and hingelinks, H, substantially as and for the purpose described.

40,676.—Grain-discharger for Harvesters.—J. D. Conyne, Lyndon, Ill.:

I claim the revolving platform, D, in combination with the tilting trough, B, arranged and applied to a harvester, substantially as and for the purpose herein set forth.

[The object of this invention is to obtain a simple and efficient device for discharging, as it is cut, the grain from harvesters, and one which may be applied to the generality of harvesters in use.]

40,677.—Fusible Safety Plug.—F. Curtis, Newburyport, Mass.:

I claim the protection of fusible safety plugs for steam boilers and other apparatus, substantially as herein described, with a coating of metal which is less fusible and less likely to corrode, and which is thin enough to offer no appreciable resistance to pressure when the metal or alloy of which the body of the plug is composed, is softened or melted by heat.

40,678.—Lubricating Spindles.—James Eaton, Boston, Mass.:

I claim the movable case containing the lubricating substance, and having one of its sides open, in combination with the semicircular main-bearing, D, which allows the spindle to come in contact with the lubricating substance, substantially as herein described.

40,679.—Knitting-machine Burr.—Horace Fisher, Waterford, N. Y.:

I claim, first, Wings, W-shaped, as described, with slots, e, adapted to fit the rim of the box-shaped hub, and the conical head, p, of the pin.

Second, The conical center pin, P p, fitted to the said wings, so as to hold them firmly in place when screwed up, and with its central bore for the axis on which the burr revolves.

Third, The combination of the wings, center pin, and box-shaped hub, substantially as described and for the purposes set forth in this specification.

40,680.—Machine for smoothing out Hides Preparatory to Tanning.—J. H. Flanders, Boston, Mass.:

I claim a combination of two endless sleeking aprons, A A′, and machinery for rotating them in opposite directions, with a table, E, or its equivalent, for supporting the skin or hide, the same being so that while such aprons may be revolving and the said hide may be brought into contact with the sleekers of the aprons, it shall be sleeked or "put out" by them, as described.

I also claim a combination composed not only of one or two endless sleeking aprons, A A′, or the mechanical equivalent thereof, and mechanism for rotating or operating such apron or aprons, or the equivalent thereof, but a table or bed, E, for supporting a skin or hide, and a mechanism for elevating the table or bed, so as to force the skin or hide into contact with the sleeking mechanism,

I also claim, in combination with one or more sleeking aprons, A A′, a rotary table, E, and a means of supporting and sliding it underneath the sleeking apron or aprons.

I also claim the combination of one or two sleeking aprons, A A′, their table, E, and a presser or pressure bar, G, to operate substantially in manner and for the purpose as specified.

I also claim the combination of steadying and restoring springs, I, or their mechanical equivalents, with the table or its carriage, and the sleeking apron or aprons, the whole operating substantially as and for the purpose set forth.

I also claim the arrangement and combination of one or more bars, H, or the mechanical equivalent thereof, with the sleeking apron, its supporting rollers and the table beneath them.

I also claim the arrangement of the sleekers, a a a b b b, on the apron, whereby, while in operation, they shall be caused to scrape or press the hide more or less, in lateral as well as in longitudinal directions.

40,681.—Corn Planter.—Clinton Foster, Prairie City, Ill.:

I claim the pistons or plungers, L, connected by rods, n, with the cranks, K, on the axles, E, of the wheels, B, the latter being provided with flanges, k, having holes, o, in combination with the arms, M, attached to the axles, E, and the semicircular rack, N, attached to the frame, A, all arranged substantially as and for the purpose set forth.

Second, The gages or flanges, m, on the wheels, B B, in combination with the beveled surface, i, and the groove or space in their peripheries, as and for the purpose set forth.

[This invention consists in a novel and improved means for dropping the corn and also for covering the same and compacting the earth snugly around it.]

40,682.—Washing Machine.—J. W. Free, Richmond, Ind.:

I claim the piece, E, in combination with the wash-boards, F and D, roller, B, handles, C, and hinges, H, when arranged, constructed and operated for the purpose and in the manner set forth.

40,683.—Loom.—M. A. Furbush, Philadelphia, Pa.:

I claim, first, the reciprocating frame, D, with its crossbar, K, and the reciprocating frame, D′, with its crossbar, K′, both being arranged to slide in the guide pieces, B and B′, or their equivalents, and to operate in conjunction with the hook-jacks, H, and other appliances herein described, substantially as and for the purpose set forth.

Second, The two-armed lever, F, with its projecting stud pins, b and b′, adapted to the sliding frames, substantially as specified.

40,684.—Machine for making Tags.—Thos. B. De Forest, Birmingham, Conn.:

I claim, first, forming the tags from a strip of material having eyes formed in a line through its center equidistant.

Second, Feeding such strip of material through the cutting or stamping-out mechanism by means of a mechanical feed.

40,685.—Loom.—John W. Drummond. New York City:

I claim, first, The mode of operation for operating the shed, as described.

Second, The mode of operation for carrying the weft thread across, as described.

Third, The mode of operation for laying up the weft thread, as described.

Fourth, The combination of the mode of operation for opening the shed, with the mode of operation for carrying the weft thread across, as described.

Fifth, The combination of the mode of operation for carrying the weft thread across with the mode of operation for laying up the weft thread, as described.

Sixth, The combination of the mode of operation for opening the shed, for carrying the weft thread across, and for laying up the weft thread, as described.

40,686.—Liniment for Rheumatism, &c.—Samuel Galland, Jefferson City, Mo.:

I claim the within described composition, or rheumatic liniment, compounded of the ingredients, in the relative proportions, quantities and manner set forth and specified, for the purposes named, as a new article of manufacture and trade.

40,687.—Revolving Fire-arm.—E. H. Graham, Yonkers, N. Y.:

I claim, first, The sliding barrel so combined with the revolving cylinder as to move longitudinally therewith and therefrom, substantially as and for the purpose herein specified.

Second, The lever, E, and link, j, combined with each other and with the frame and sliding barrel of the fire-arm, substantially as and for the purpose herein specified.

Third, Giving the cylinder axis pin of a revolving fire-arm, a longitudinal motion back and forth, substantially as and for the purpose herein specified.

[This invention consists in a sliding barrel so combined with a revolving cylinder as to slide longitudinally into and from the cylinder, and that each charge, while being fired, is contained in the barrel itself, the rear portion of the barrel forming the only chamber of the arm. It also consists in certain mechanism for producing the longitudinal movement of the barrel, and further, in giving the axis pin of a revolving fire-arm a longitudinal movement which may be instrumental in cocking the hammer.]

40,688.—Washing Machine:—James Hanchett and J. R. Gill, Charleston, Ill.:

We claim, first, The swinging pressure board or plunger, D, provided with a valve, f, in combination with the stationary pressure board, G, provided with oblique or inclined flutes or projections, all arranged as and for the purpose specified.

Second, The combination of the arm, H, bent or curved bar, I, shaft, J, bar, M, link, N, and lever, O, arranged substantially as shown, for the purpose of operating the swinging pressure board or plunger, D.

Third, The fixed and movable bearings, K K′, provided each with a series of holes, o, for regulating the operation of the pressure board, or plunger, D, relatively with the board, G, as set forth, when used in combination with a catch, p, and toggle lever, H I, substantially as described.

[This invention relates to a new and improved clothes-washing machine of that class in which a swinging pressure board is used in connection with a stationary one. The invention consists in a peculiar construction and arrangement of the aforesaid parts in connection with the means employed for operating the moving parts, the construction of the suds-box, and other features of a novel and improved character.]

40,689.—Horse-shoe Machine.—Moore Hardaway, St. Louis, Mo.:

I claim the arrangement and combination of the rotating disk, C, forms, f, and clamps, g g′, all being constructed and adjusted to operate substantially as and for the purpose set forth.

40,690.—Machine for Sawing Laths, Palings, &c.—Smith Head, Millersburgh, Pa. Ante-dated Nov. 11, 1863:

I claim, first, The serrated wheels, R R, shaft, G, and gravitating frame, F, in combination with the bed-piece, A, and circular saw, O, when arranged to operate in the manner and for the purpose specified.

Second, The vertical shaft, H, having two or more circular saws, V V, secured on its upper end, in combination with the adjustable head block, I, and two or more saws, P P, secured on a shaft, C, placed at right angles to the shaft, H, when arranged to operate in the manner and for the purpose specified.

Third, The shaft, J, provided near its lower end with a serrated wheel, L, the slide, K, and foot lever, N, in combination with the head block, I, when arranged to operate in the manner and for the purpose specified.

[This invention consists in a novel arrangement of serrated wheels and gravitating frame, in which latter the shaft of said wheels is journaled, in combination with a stationary bed and circular saw, for cutting slabs into bolts of a convenient size to be worked up into laths and paling. It also consists in the combination of two or more circular saws secured equidistant apart on a vertical shaft for cutting the bolt into the widths it is desired to have the laths or paling, with an adjustable head block, and two or more circular saws secured on a horizontal shaft for giving the proper thickness to the laths or paling cut from the bolt. It further consists in a novel device for feeding the bolt to the saws.]

40,691.—Side-saddle Tree.—William Hill, of New York, N. Y.:

I claim a side-saddle tree, having its side pieces, C C′, pommel, A, and cantel, B, constructed, arranged and combined in the manner as herein shown and described.

[This invention consists in constructing the tree in such a manner that it will give the required form to the seat of the saddle, and the labor of building up or stuffing the tree in order to get the proper form dispensed with.]

40,692.—Lubricating Axle.—J. F. Hinman, Battle Creek, Mich.:

I claim the combination of the elastic band, E, and its groove, a, with the cover, F, and oil orifice, D, in the manner herein shown and described, for the purpose described.

[The object of this invention is to obtain a simple means for lubricating the axles of wheel vehicles without removing the wheels from the axle.]

40,693.—Machinery for the manufacture of Starch.—Thomson Kingsford, Oswego, N. Y.:

I claim the washing up of starch deposits by causing a current or currents of water to pass rapidly over their surface, by means of a revolving wing or gate, moving just above the surface of the impacted or cohering starch, and capable of ready adjustment to its depth in the containing vessel, substantially in the manner hereinbefore described.

40,694.—Railroad Switches.—C. B. Lasher, New York City:

I claim the switch rail, i, fitted substantially as specified, in combination with the flange, g, on the car axle or wheel, to give direction to the car from the main track upon the turn-out, as set forth.

40,695.—Thrasher.—David Lippy and J. S. Bradley, Mansfield, Ohio:

I claim, first, The screen, R′, in the elevator box, Q, arranged in combination with the elevators, R, to operate in connection therewith, as and for the purpose herein set forth.

Second, The screen, N, placed within a box, O, below the shoe, M, and arranged to operate in connection therewith, as and for the purpose specified.

Third, The combination of the grain conveyer, F, straw carrier, D, shoe, M, elevators, R, fan, G, and screen, N, all arranged in combination with the thrashing cylinder, B, and concave, C, to operate as described.

[This invention consists in a novel and improved construction of a straw carrier arranged with a grain conveyer, fan, shoe, screens and grain elevator, all arranged to operate in such a manner that the grain, at one and the same operation, is thrashed from the straw and separated from it, and also separated from all foreign substances and impurities.

40,696.—Separating Fibers of Straw, &c.—Azel S. Lyman, New York City:

I claim, first, The mode of making the macerating process continuous, by supplying and discharging the material, and the water necessary to effect maceration by means of a continuous forced circulation through the boiler or maceratiug apparatus, effected by a pump or its equivalent, substantially as herein specified.

Second, Saving the heat of the discharging pulp or macerated material by retaining it under pressure after it has left the boiler, or macerating apparatus, and passing the incoming fibrous material and water in a contrary direction to the discharge, through a suitable system of pipes or passages properly arranged in relation to the discharge pipes or passages, substantially as herein described.

Third, Forcing the boiled material from the boiler through a mill or other grinding or rubbing apparatus, by the combined or simultaneous action of the pump, or its equivalent, through which the circulation through the boiler is produced, and of the pressure due to the heat of the steam or water in the boiler, substantially as herein specified.

Fourth, The employment in the pump by which the circulation through the boiler is produced, of cutting valves, operating substantially as and for the purpose herein set forth.

Fifth, The employment for transferring the heat from the discharging to the incoming material of twin or double pipes, F F, substantially as herein described.

40,697.—Butter Worker.—James B. Lyons, Milton, Conn.:

I claim the construction and arrrangement of a spirally-fluted conical roller, in combination with an inclined circular revolving table; placed in a tub, together with a perforated receptacle to distribute a given quantity of salt, in the manner herein described for the purposes specified.

40,698.—Loom.—Bela A. Mann, West Meriden, Conn.:

I claim, first, The hooked bars, N, in combination with a pattern mechanism substantially as described.

Second, The employment in combination with the hooks, N, and a pattern mechanism of the slides, L and K, moving in opposite directions for operating the hooks, substantially as described and specified.

Third, The arrangement in combination with the hook bars, N, of the adjustable cranks, w and W, for driving the slides, L and K, substantially as described and specified.

Fourth, The arrangement of the bell cranks in combination with the hooks, N, slides, L and K, and pattern mechanism for operating the harnesses, substantially as described and set forth.

40,699.—Machine Belting or Banding.—Thomas J. Mayall, Roxbury, Mass.:

I claim the improvement in the manufacture of machine belting or banding which consists in forming belts or bands of gutta percha and picked or ground leather, substantially as described.

I also claim in combination with the above the admixtnre of india-rubber, in such new belts or bands as set forth.

40,700.—Fulling Mill.—Thomas J. Mayall, Roxbury, Mass.:

I claim in a fulling mill the combination of a trough for containing the proper liquid, two or more elastic longitudinally fluted or corrugated rollers and two or more elastic rollers with plain surfaces, the whole operating together upon the cloth as described.

40,701.—Self-tightening Bands for Hay Forks.—James H. Melick, Albany, N. Y.:

I claim, first, So applying a band, a, to a rake-head, fork-head, or other like article, that the strain upon the tines of the fork, in the act of use, shall lighten the band thereon in proportion to the strain applied upon the lines, substantially in the manner and for the purpose described.

Second, The slotted band, a, so constructed and applied to a wooden or other head that the tine will act as a key to tighten the band upon the head, and thereby tighten the tine in the same proportion, substantially as set forth.

Third, Sustaining the strains upon wooden heads or stocks of agricultural implements, by means substantially as described.

40,702.—Photographic Album.—John D. Mets, Dubuque, Iowa:

I claim, first, Uniting the card receiving leaves together in pairs by means of flexible strips of cloth or other suitable material, enclosing a filling, substantially as described.

Second, So disposing the filling strips, e e f, within the flexible connecting strips, b b, that a space will be formed for the reception of the bend of the filling strip, f, when the leaves are stitched together, substantially as described.

Third, Constructing a photograph album of a series of pairs of leaves stitched together, substantially as described.

40,703.—Vapor-burning Cooking Stove.—Oscar F. Morrill, Chelsea, Mass.:

I claim the insulator clamp as constructed or provided with the projection, y, and with the hanger or stirrup, z, they being for the purposes as specified.

I also claim the combination of the clearer, h, as above described with the conduit valve and its seat passage.

I also claim the improved burner as made or provided with the lateral clearing port, g, and with a cap or cover, f, therefor, the same being arranged with respect to the jet tube of the conduit, substantially in manner and for the purpose as described.

I also claim the combination of the steadying fork or notched projection, u, and the tenon, q, and its mortise, p, with the conduit and the supporting stand.

40,704.—Water Wheel.—Freeman Morse, Hastings, N. Y.:

I claim a water wheel having buckets formed upon it in the manner described and extending from the top to the bottom of the penstock in which it is fitted to run, in combination with the penstock when the floor of the same is level with the bottom of the inlet and water way so that the water shall strike the buckets of the wheel and expend a portion of its force before commencing to rise in the penstock, as and for the purpose specified.

[By this invention a much greater per centage of power is obtained from the same volume and fall of water than when the water has to ascend an inclined plane before it impinges the buckets of the wheel as is usually the case in wheels of this character.]

40,705.—Straw Cutter.—Wm. Newlin, Ash Ridge, Ohio:

I claim, first, Connecting the knife gate, S, to the treadle, E′, by means of a bar or rod, g, which at its upper end is swiveled in the sill of the knife gate and at its lower end is bent in the manner and for the purpose specified.

Second, The knife gate or sash, S, adapted to move up and down in slots in the hollow standards, C C, in combination with the inclosed spiral springs, f f, swiveled bent rod, g, and lever, E, when arranged to operate in the manner and for the purpose specified.

[The principal novelty of this invention consists in an arrangement of devices whereby an inward draught of the movable or gate knife upon the stationary or bed knife is obtained.]

40,706.—Pontoon Boat.—Robert Pallett, New York City:

I claim, first, The combination with a pontoon boat of the construction described, of the swinging bolster, L L′, and swiveled chains, J L, constructed, arranged, and operating in the manner and for the purpose specified.

Second, In a pontoon boat constructed substantially as specified, I claim the combination of the blocks, c c, with the dovetail tapering sockets, B B, to permit the ready insertion and removal of the wheels, E E.

Third, A convertible pontoon boat constructed and arranged as herein represented and described, with removable wheels applied as specified to permit of its ready adaptation for use as a boat, or for transportation for use as a boat, or for transportation on land upon its own wheels.

[By means of this invention a pontoon boat can be readily launched or set up on its wheels for transportation on land, by a single man, and when on land it constitutes a wagon adapted to convey the beams, planks and other materials of the bridge.]

40,707.—Making Bread.—James Perry, Brooklyn, N. Y.:

I claim in the manufacture of farinaceous food the combination of the fermentive and aerative processes, substantially as described and for the purposes herein set forth.

40,708.—Pump.—J. H. Plank, Pulaski, Iowa:

I claim the levers, C and C′, of the first and second order respectively, fulcrumed to posts, D, D, and connected together by a pin, a, and slot, b, in combination with the rods, E E, and plungers, B B′, when arranged to operate in the manner and for the purpose described.

[This invention consists of two plungers fitted to work up and down in a single barrel or cylinder in combination with two levers of the first and second order, fulcrumed to posts which rise from two opposite sides of the cylinder, said levers being connected together by a pin, which projects from the side of one of the levers and works in a slot in the other in such a manner that when one lever is moved up or down, a corresponding movement in a reverse direction is imparted to the other, by which means the two plungers are caused to alternately approach to and recede from each other and thus cause the water to discharge in a continuous stream.]

40,709.—Horse Pitchfork.—Squire Raymond, Genoa, N. Y.:

I claim, first, The swivel pulley, C, applied to the fork arms or frames, A A, substantially as and for the purpose herein set forth.

Second, The applying of the rope, F, to the extension, f, of the lever, E, through the medium of the pulleys, i j, arranged substantially in the manner as and for the purpose herein set forth.

[This invention relates to an improvement on a horse pitchfork for which Letters Patent were granted to this inventor, dated Nov. 11, 1862.]

40,710.—Furnace for making Malleable Iron.—Moses Salter, Saltersville, N. J.:

I claim, first, The combination of one or more reducing furnaces with a welding furnace so that the sole or hearth of either furnace shall be in the plane of or in continuity with the sole or hearth of the others, substantially as herein set forth.

Second. The arrangement of one or more reducing furnaces at right angles, relatively to a welding furnace, when the soles or hearths of the respective furnaces are all in the same plane, substantially as herein set forth.

Third, In reducing and welding furnaces located at an angle in respect to each other, and having substantially one sole or hearth in common, I claim the arrangement of a fire chamber in the welding furnace and of a chimney in the reducing furnace or furnaces, so that the flame or heated gases shall pass from end to end throughout the whole extent of the furnaces, substantially as herein set forth.

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Fourth, The combination with a welding and one or more reducing furnaces located at an angle in respect to each other of a single sole or hearth contracted laterally at the junction of the reducing furnaces with the welding furnace.

Fifth, Locating the working doors of the reducing furnace or furnaces in close vicinity of and underneath the chimney, so that the air which may enter the furnace shall be carried off without coming in contact with the ore to be reduced, substantially as herein set forth.

Sixth, Forming an interior corner lining of the welding furnace, by means of a cast-iron bevel tube open at both ends and extending along the border of the hearth, substantially as herein set forth.

40,711.—Cider Mill.—Theodore Sharp, Louisville, Ky.:

I claim, first, The single concave constructed and arranged in the manner described to vibrate across the face of the main cylinder and between its flanges, as and for the purpose set forth.

Second, The combination of a single concave constructed substantially in the manner described with a flanged main cylinder and hopper, arranged as and for the purposes set forth.

40,712.—Furnace Grate.—George L. Smith, Brooklyn, N. Y.:

I claim the forming of grate bearers, for steam boiler and other furnaces, with the beveled or contracted top, or upper surface, A, on which the grate bars rest substantially as and for the purpose set forth in the specification.

40,713.—War Turret.—George Snedecor, New York City:

I claim uniting the two or more series of iron plates or slabs of which a gun turret or other portion of a vessel or fortification is composed by means of dovetail tongues and grooves, when the faces of such tongues and the backs or bottoms of the grooves are presented inward and outward or in a direction to receive the impact of projectiles, substantially as herein described.

40,714.—Button Key.—Henry St. John, New Haven, Conn:

I claim a button key, one leg of which is straight the other curved, substantially as described, so that both legs may be inserted into the eye of a button, in the manner and for the purpose specified.

40,715.—Locomotive Tender.—Archibald Sturrock, Doncaster, England. Patented in England May 6, 1863:

I claim the employment of and fitting auxiliary cylinders and engines on or to the tender, and connecting them through ordinary connecting rods to the wheels of the tender, said tender cylinders receiving steam from the ordinary boiler which supplies the engine proper, substantially as described.

I also claim forming the water tank in the tender with a false bottom and leading the exhaust steam from the tender cylinders into the chamber between the two bottoms, substantially as set forth.

40,716.—Invalid Bedstead.—Wm. Swift, Brooklyn, N. Y.:

I claim an invalid attachment for bedsteads composed of the two parallel bars, A A, resting either in a fixed or movable manner on cross-rails, B B, attached to the bedstead, and having the folding bars, a a a′ a′ c c, attached to them provided with canvass, C D, all being arranged substantially as herein set forth.

[The object of this invention is to obtain a simple and economical invalid attachment which may be applied to any ordinary bedstead and constructed in such a manner as to admit of the patient being placed in a lying or more or less recumbent position as may be desired, and at the same time admit of the bed clothing being changed when necessary, without disturbing the patient in the least, and also affording a free circulation of air for the patient.]

40,717.—Steam Plow. Anson P. Thayer, Syracuse, N. Y.:

I claim, first, The spades, constructed and operating in the manner set forth.

Second, The couplings, G G and I I, operating in combination with the wheels, E E and L L, and shafts, F F, the screws, S S, and slatted posts, r r, for the purpose of raising and lowering the cylinder, t, and spades, u, in a vertical line, and admitting the gearings, E E and L L, to be in a working position at all points as described.

Third, The wheels, Q, in combination with the shaft, D, and counter shafts, P P, for the purpose set forth.

Fourth, I also claim the slotted frame, h, or guides in combination with the grooved pulleys, f, and tongue, g, for the purposes described.

40,718.—Manufacture of Leather.—Amzi H. Van Gieson, Newark, N. J.:

I claim the combination by the means above described of a grain surface of fine leather with a body of heavier texture, substantially as set forth.

40,719.—Water Wheel.—G. W. White, Monroeton, Pa.:

I claim, first, Constructing the buckets, d, of the wheel so as to have two inclined surfaces, 1 2, to form a concave or V-shaped face, and having lips, f, at their outer edges, as and for the purpose specified.

Second, Placing the wheel, F, in the lower part of a case, B, which is inserted in the pan-stock, A, in connection with the open top of the wheel, whereby the water is allowed to pass directly from the penstock to the wheel and the water after acting upon the wheel allowed, in case of back-water, to pass over the top of the wheel as set forth.

40,720.—Expansible Tompion for Fire-arms.—George R. Willmot, Meriden, Conn.:

I claim the employment in a tompion in combination with an expanding packing of vulcanized gum, of an outer covering of leather, cloth, felt, velvet, plush, or other soft unadhesive material, which contains no elements that can corrode metal and an interposed flexible material, such as unvulcanized gum which is impervious to the sulphur of the vulcanized gum, substantially as herein described.

I also claim the use in an expansible tompion of the casing or tube, k, in the described combination with the screw, C, elastic ring, d, and plates, A and B, for the purpose specified.

40,721.—Gang Plow.—Lorenz Wolf, St. Louis, Mo. Antedated Nov. 11, 1863:

I claim, first, The employment of the standard box, f f′ f″ e i, constructed and arranged as herein described for the purposes set forth.

Second, The within-described arrangement and combination of the levers, r n, with reference to the beam, C, and stem or wheel standard, l, of my improved gang plow, substantially in the manner and for the purposes herein set forth.

Third, The use of the rocker iron, k, formed, constructed and arranged to operate substantially in the manner and for the purposes herein set forth.

40,722.—Steam Generator.—W. C. Baker (assignor to himself and J. J. Smith), New York City:

I claim a steam generator, formed of a coil or series of connected pipes, substantially as described, in combination with the means shown or its equivalent, for inducing the supply of water to the lower tubes from the upper portion of the coil, substantially as described for the purposes set forth.

40,723.—Force Pump.—S. D. Gilson, Syracuse, N. Y., assignor to himself and Joseph Hall, Rochester, N. Y.:

I claim, first, The arrangement of the two valves, E F, in a cage, G, so that the water is both taken into the pump and discharged therefrom, through the said cage, substantially as and for the purpose herein specified.

Second, The arrangement of the cage, G, in a casing, B, which is inserted into and removed from its place in a direction at right angles to the axis of the cage and to the movements of the valves, substantially as herein described.

Third, In combination with the arrangement of the two valves and valve seats in the cage, I claim the fitting of the valves one within the other, in such manner that each constitutes a guide for the other within the cage, substantially as herein specified.

Fourth, The attachment of the valve casing to the cap, C, by a screw bolt, D, or its equivalent, to allow the said casing to be withrawn with the cap, substantially as herein set forth.

[The principal object of my invention is to provide for the speedy removal and replacement of the valves of a locomotive or other force pump, and it consists in a certain construction of the valve casing and mode of applying the same in the pump, and in a certain arrangement of the valves within the casing, whereby the above result is obtained.]

40,724.—Lock.—T. G. Harold (assignor to himself and J. W. Kissam), Brooklyn, N. Y.:

I claim, first, A lock case of two parts, fitted to screw or lock together and prevented from turning by the bolt or shackle as specified, in combination with the stationary and turning blocks and divided stop pins, whereby opportunity is afforded for changing the position of the said stop pins and adapting them for a different key, as set forth.

Second, I claim the hook-shaped bolt extending from the turning block and contiguous to, and supported by, the curved interior of the lock case, in combination with the divided stop pins and with the hasp or bolt, whereby the strain on the hasp or bolt is taken by the lock case, instead of the divided pins, as specified.

40,725.—Beehive.—H. A. King and Jacob Loughmaster (assignors to H. A. King, N. H. King and A. A. King), Seal, Ohio:

We claim, first, The fitting of the honey board, E, on rebates, l l, within the hive, in the manner and for the purpose specified.

Second, The cross bar, k, at the upper end of the slide, f, provided with the beveled notches, j j, to fit over the beveled surfaces, i, at the upper ends of the front and back of the hive, for the purpose specified.

Third, Securing the cap, H, on the hive, by having the former of sufficient dimensions to fit over the top of the body, A, and securing strips, s, within the cap, H, to rest on the top of the body, A, and support the cap, as set forth.

Fourth, The flap or slide, w, attached to the hive, and provided with the holes, a′ c′, in combination with the holes, v b′, in the side of the hive, and the groove, t, in the inner surface of the side of the hive, as and for the purpose specified.

[This invention consists in a novel means employed for regulating the capacity of the bee-entrances, and also in the employment or use of a partition plate arranged in connection with the bee-entrances, in such a manner that the bees may be confined to either side of the hive. The invention further consists in a novel way of arranging the honey board or fitting it within the hive, and in a novel arrangement of a slide and cap, and ventilating device, whereby it is believed that many advantages are obtained over the ordinary hives in use. An illustration of this bee-hive will be found on another page of this paper.]

40,726.—Watch Key.—R. S. Meershon (assignor to himself and John M. Harper), Philadelphia, Pa.:

I claim a pin or pins in one part, and two teeth in the other part, operating together in the manner and for the purpose substantially as described.

40,727.—Floor Clamp.—D. K. Peoples (assignor to himself and John Peoples), Philadelphia, Pa.:

I claim the frame, C, and its hooked arms, E and E′, in combination with the screw, F, and nut, G, or their equivalents, the whole being constructed, arranged and operating substantially as and for the purpose herein set forth.

40,728.—Manufacture of Paper Pulp.—A. H. Tait, Jersey City, N. J., and W. H. Holbrooke, New York City:

We claim, first, The passing of straw between grinding surfaces in the manfacture of paper pulp, substantially in the manner for the purpose hereinbefore described.

Second, Treating the stock after it has passed through a weak alkaline and chlorine treatment, with or without acid, to a second application of weak alkali and chlorine, with or without acid, substantially as above described for the purpose of making paper pulp.

RE-ISSUES.

1,571.—Hose Coupling.—Emerson Gaylord (assignee by mesne assignments of L. M. Ferry), Chicopee, Mass. Patented Oct. 7, 1856:

I claim combining with an interposed elastic packing ring, the connecting and disconnecting of the two parts, substantially as described, so that by the application of force to one side only of the coupling the two parts will be drawn together all around, as described, and thereby insure a water-tight joint, or entirely release them from their bond of union with each other.

1,572.—Printing Press.—G. P. Gordon, Brooklyn, N. Y. Patented January 1, 1856:

I claim, first, Combining with a rotating disk, an annular ring or outside disk, the two revolving each in an opposite direction to the other, for the purpose of breaking up the ink, so that it shall, by such contrary motions, become evenly distributed and thus imparted to the inking rollers.

Second, I claim moving one or more of the inking rollers from the parallel position they occupy for inking the form to an oblique position, which shall give to them a lateral motion when in contact with the distributing disks or their equivalent for the purpose specified.

Third, I claim combining with a rotating reciprocating cylinder or segment of a cylinder, a bed, which during its reciprocating movement alternately changes its motion: first, traveling under and in contact with the cylinder or segment of a cylinder, to give an impression, then being withdrawn from contact with the cylinder or segment of a cylinder, and remaining withdrawn during the return movement, to prevent an impression being taken; such bed alternating from one of these positions to the other, thus performing two separate and distinct motions, entirely independent of and in a contrary direction to each other, while remaining in gear with the cylinder or segment of a cylinder.

Fourth, I claim attaching to a reciprocating bed an adjustable rack as well as a stationary rack, which two racks shall play into gear upon a cylinder or segment of a cylinder, so that any and all wear or variation may at once be taken up by adjusting the moveable rack, and by this means always cause the bed and cylinder or segment of a cylinder to work in harmony with each other, and produce a clear and sharp impression, free from slur.

Fifth, I claim placing a reciprocating bed in a vertical position or in any given angle from a horizontal position, when said bed is combined with a rotating reciprocating cylinder or segment of a cylinder, which shall place or pile the printed sheets upon a pile board, as herein described.

Sixth, I claim using with a vibrating bed, a rotating disk he purpose of distributing the ink.

Seventh, I claim using with a vibrating bed, a rotating disk surrounded by an annular ring or outside disk, the two revolving each in an opposite direction to the other, for the purpose of breaking up the ink, as herein fully described.

Eighth, I claim the use or employment of a rotating ink distributing table, in combination with an impression produced by a cylindrical surface.

1,573.—Closing Preserve Cans.—J. F. Griffen, Brooklyn, N. Y., assignee by mesne assignments of Theodore Sellers, East Birmingham, Pa. Patented May 22, 1863:

I claim the employment of a yielding packing ring, arranged on either the jaw, neck or the cover, in combination with a neck and cover, so constructed as that in forcing the two together the ring will be compressed and its yielding surfaces accommodated to the surfaces of the neck and cover, and a tight joint be formed, substantially as described.

I also claim providing either the cover or the jar neck with a depression for the retention of the packing ring, when the cover and jar are separated, substantially as hereinbefore described.

1,574.—Hot-air Furnace.—Oscar Paddock, Watertown, N. Y. Patented Nov. 27, 1860:

I claim, first, The mechanism herein described or its mechanical equivalent, for automatically operating in the manner and for the purposes set forth, valves of hot-air furnaces or other heat generator, by means of the furnace door, the mechanism being such as to afford the means of regulating the draft in the furnace independently of the door, substantially as herein shown and described.

Secondly, I claim the weighted valve or damper coupled with the furnace door, under an arrangement whereby the opening or closing of said door will cause the weight to operate the valve, substantially in the manner and for the purposes set forth.

Third, I claim combining the weighted valve with the door by means of a connecting rod, so constructed or so arranged, that while actuated by the door, as set forth, the valve may also be operated by hand to regulate the draft in the furnace, substantially as herein shown and described.

1,575.—Hot-air Furnace.—Oscar Paddock, Watertown, N. Y. Patented Nov. 27, 1860:

I claim, first, In combination with both the main and the auxiliary chimney, arranged respectively in rear and front of the fire, coupled valves or dampers actuated by the furnace door or otherwise, in the manner and for the purposes set forth.

Second, I claim the herein-described valve arrangement, capable of being operated by the movement of the furnace door as well as by hand, the same consisting of a weighted oscillating valve, and a connecting rod extending in front beyond, but abutting at a shoulder or some projecting part thereof against the door or against any fixture of the same, the whole being combined for operation substantially as herein shown and described.

Third, I claim the herein-described valve arrangement, capable of being operated by the movement of the furnace door, as well as by hand, the same consisting of a pivoted slotted sector forming connection between the door and a slotted valve rod of a weighted valve or damper, the whole being arranged for operation substantially as herein shown and described.

1,576.—Bottle and Bottle Stopper.—W. A. Shaw, Boston, Mass. Patented Dec. 17, 1861.

I claim constructing a stopper of vulcanized rubber or its equivalent, when made hollow to facilitate changes of its diameter, and with a confining shoulder for the purpose specified.

Also, constructing a stopper of vulcanized rubber or its equivalent, when made with a shoulder, a, substanstantially as described, or with two shoulders, a and b.

Also, constructing the neck of a bottle or other socket which receives a stopper with a shouldered contraction, t, which extends entirely around the socket and operates in conjunction with the stopper, substantially as described.

And constructing the neck of a bottle or other socket, which receives a stopper with shouldered contractions, 1 2, which operate in conjunction with the stopper, substantially as described.

1,577.—Composition for Lubricating.—James Turner, New York City. Patented July 7, 1863:

I claim, first, A lubricating compound made of the ingredients herein specified and mixed together in the manner and about in the proportion set forth.

Second, The use of red oil or the residuum obtained in the manufacture of candles, in combination with paraffine or the heavy oil of petroleum and lime water or alkaline lye, substantially as and for the purpose herein described.

Third, The use of saw-dust, in combination with the fatty substances and alkaline lye or lime water, as and for the purpose specified.

[This invention consists in mixing together paraffine or the heavy oil contained in petroleum and red oil or the residuum from the fat or other material used in the manufacture of candles, with lime water or other alkaline lye and saw-dust, in such a manner that by the action of the red oil the mixture of paraffine or heavy oil and lime water or alkaline lye is made to harden, and by the saw-dust the lubricating qualities of the fats are retained and a compound is produced which can be used with great advantage and economy for lubricating axles and heavy gearing.]

1,578.—Composition Sole for Boots and Shoes.—Preston Ware, Jr., Newton, Mass., assignee by mesne assignments of J. M. Wimley, Philadelphia, Pa. Patented Feb. 5, 1856:

I claim, first, The method of forming soles of a suitable plastic composition, by molding the same upon staples or other mechanical clinching devices, so as to partly incorporate them, said composition being such as will, after being molded, undergo a change whereby it becomes more or less hard, tough, flexible or impervious to water.

Second, The method of securing or fastening composition soles to boots and shoes or the uppers thereof, by means of staples or their mechanical equivalents, which are incorporated with the soles during the act of molding the same.

1,579.—Composition Sole for Boots and Shoes.—Preston Ware, Jr., Newton, Mass., assignee by mesne assignments of John Wimley, Philadelphia, Pa. Patented Feb. 5, 1856:

I claim the combination of a composition sole with staples or other metallic clinching devices, when the latter are partly embedded in or incorporated with the former, substantially as set forth.

1,580.—Boots and Shoes with Composition Soles.—Preston Ware, Jr., Newton, Mass., assignee by mesne assignments of J. M. Wimley, Philadelphia, Pa. Patented Feb. 5, 1856:

I claim, as a new article of manufacture, a shoe or boot the sole of which is made with composition, and attached by means of staples or other metallic clinching devices, partly imbedded in or incorporated with the sole.

DESIGNS.

1,851 to 1,868.—18 Patents for Designs for Carpet Patterns.—H. G. Thompson, New York City, assignor to the Hartford Carpet Co., Hartford, Conn.

1,869.—Design for German Type Alphabet.—W. H. Page (assignor to H. Page & Co.), Norwich, Conn.

IMPORTANT TO INVENTORS

PATENTS FOR SEVENTEEN YEARS.

MESSRS. MUNN & CO., PROPRIETORS OF THE SCIENTIFIC AMERICAN, continue to solicit patents in the United States and all foreign countries, on the most reasonable terms. They also attend to various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent free of charge. Address MUNN & CO., No. 37 Park Row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model of drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office. Address MUNN & CO., No. 37 Park Row, New York.

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HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical productions he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank-bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

The revised Patent Laws, enacted by Congress on the 2d of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the Government fee required on filing an application for a patent is *reduced* from $30 to $15. Other changes in the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design, three and a half years	$10
On filing application for Design, seven years	$15
On filing application for design, fourteen years	$30

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (but in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

During the last seventeen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence of the confidence reposed in our Agency by the inventors throughout the country we would state that we have acted as agents for at least TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees at home and abroad. Thousands of inventors for whom we have taken out patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the inventors whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in our extensive offices, and we are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with us on the subject, giving a brief history of the case, inclosing the official letters &c.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat, under the new law, is $10. A pamphlet of advice regarding applications for patents and caveats, printed in English and German, is furnished gratis on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through the Scientific American Patent Agency, No. 37 Park Row, New York.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through our Agency, the requirements of different Government Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park Row, New York, or any of our branch offices.

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Assignments of patents, and agreements between patentees and manufacturers are carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

It would require many columns to detail all the ways in which inventors or patentees may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of patentees will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park Row, New York.

Back Numbers and Volumes of the Scientific American

VOLUMES I., II., III., IV., V., VII. AND VIII. (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $2 25 per volume, by mail, $3—which includes postage. Every mechanic, inventor or artizan in the United States should have a complete set of this publication for reference. ubscribers should not fail to preserve their numbers for binding. OL. VI. is out of print and cannot be supplied.

Notes and Queries

H. C., of Pa.—You will find a description of an expanding cannon ball on page 20, Vol. III. (old series) of the SCIENTIFIC AMERICAN. After it left the mouth of the gun, a set of huge knives expanded from it to cleave their way like a set of flying scythes. It was the invention of W. Beale, of Boston, Mass.

S. F. H., of N. Y.—As we understand your theory, of the vibrations on the dam at Fort Edwards being caused by the attraction of gravitation overcoming the attraction of cohesion, it means the separation of the particles of water by their increasing velocity as they descend. This theory has been advanced before, and Professor Loomis has referred to it, but considers it untenable.

O. C. H., of Conn.—The *Photographic News* is devoted exclusively to the photographic and kindred arts, not metallurgy.

J. N. W., of N. Y.—The dam at Lawrence, Mass., which is subject to vibrations, is open at one end to the space behind the falling water, so that there cannot be a vacuum behind the sheet. Your theory that a vacuum behind the sheet of falling water is the cause of the vibrations would not hold good in this case. Could you not make some experiments and give the results.

M. T. W., of R. I.—We have never published an illustration of the steam carriage you refer to. It ascends grades readily.

J. S. M., of Conn.—The apparatus for keeping grindstones true is highly spoken of. We saw one lately in Providence, R. I., which was merely one stone driving another of smaller size by contact of the forces, or in a manner represented by placing two coins edge to edge. The larger stone travelled back and forth laterally by means of a screw journal while the smaller one was stationary; in this way both stones were always true. We believe the apparatus is not patented in this country; it was made in England.

D. B. D., of Ohio.—The boilers have 90 pounds per square inch pressure upon each one. We are always glad to impart information in this column, but our time is too valuable to be spent in settling disputes. Your other questions are too silly to be noticed. We never heard of a "conical" inch.

T. T., of N. Y.—We answered your former letter through the Postoffice and inclosed the card of a manufacturer of reflectors. You had better personally investigate the matter, and thus satisfy yourself of the feasibility of getting additional light by the means suggested.

C. B. H., of N. Y.—Rosin is employed to coat the interior of lager beer casks, to prevent beer from acquiring the taste of the wood, also to prevent the air from passing through the pores and being absorbed by the beer. Were the beer not perfectly excluded from the air it would soon become flat, turbid and sour.

N. T. C., of Mass.—The kind of iron of which steam boilers are made has nothing to do with their priming. When a steamer enters a river from the sea, and fresh, instead of salt, water is taken into the boilers for feed, priming is sure to follow. Dirty water and an insufficient amount of steam room, alike cause a boiler to prime. The cause for this is not well understood.

Money Received.

At the Scientific American Office, on account of Patent Office business, from Wednesday, Nov. 25, to Wednesday, Dec. 2, 1863:—

J. H., of Cal., $20; F. B. H., of Ind., $204; H. H. B., of N. Y., $45; J. A. C., of N. Y., $20; W. H. G., of N. Y., $20; H. W. C., of Vt., $16; H. & B., of N. J., $16; M. F., of N. Y., $20; R. S. H., of Iowa, $42; G. H. L., of Ill., $20; W. W., of N. J., $20; G. S., of N. Y., $16; W. R. C., of Ill., $10; A. A. D., of Mich., $16; J. A., of N. Y., $25; H. J., of Mass., $19; J. E. B., of Ill., $16; J. R. A., of N. Y., $16; F. W. W., of Ill., $10; J. J. E., of N. Y., $197; J. J. G., of Ohio, $178; S. R. B., of Wis., $16; W. E. D., of N. Y., $16; I. K. B., of Ohio, $20; J. Van D., of N. Y., $45; D. D., of N. Y., $20; L. H., of N. Y., $20; G. B. F., of N. Y., $20; J. H., of Iowa, $45; G. P. S., of N. Y., $22; L. & G., of England, $49; C. F. & J. W. T., of Wis., $20; A. V., of N. Y., $20; J. E. of N. Y., $20; L. B. S., of Conn., $16; A. E. H., of N. Y., $25; J. G., of Ill., $25; C. D. B., of N. Y., $16; S. M., of Ill., $16; B. W., of N. Y., $25; J. S. W., of Va., $25; P. H. of Pa., $40; C. & B., of Mass., $25; V. D. S., of Iowa, $20; C. A., of N. Y., $16; J. S., of N. Y., $16; A. & McG., of N. Y., $20; S. D., of Pa., $45; W. C. M., of N. Y., $16; A. J. S., of Ill., $20; A. C. C., of N. Y., $16; S. J. A., of Cal., $20; H. G. S., of N. Y., $22; J. B. A. of Ill., $20; J. B. H., of R. I., $20; C. F. B., of Mass., $25; C. & D of Conn., $16; G. T., of Mich., $16; E. C., of Mich., $16; S. N. T., of Wis., $26; C. F., of Ill., $30; H. & McN., of N. J., $25; D. K., of Mich., $19; J. P. N., of Mo., $16; M. B., of Ky., $16; A. & H., of Conn., $16; S. & M. P., of Pa, $58; D. & C., of N. Y., $25.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgement by mail, and their initials are not to be found in this list, they will please notify us immediately, and inform us the amount, and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office, from Wednesday, Nov. 25, to Wednesday, Dec. 2, 1863:—

H. G. S., of N. Y.; C. F. B., of Mass.; J. S. W., of Pa.; J. A., of N. Y.; M. W. B., of Ind.; R. & Y., of N. Y.; A. P., of Mass.; J. J., of N. Y.; H. & McN., of N. J.; J. G., of Ill.; S. N. T., of Wis.; P. H., of N. Y.; G. S., of N. Y; C. & B., of Mass.; A. E. H., of N. Y.; B. W., of N. Y.; D. K., of Mich.

Binding the "Scientific American."

It is important that all works of reference should be well bound The SCIENTIFIC AMERICAN being the only publication in the country which records the doings of the United States Patent Office, it is prepared by a large class of its patrons, lawyers and others, for reference some complaints have been made that our past mode of binding in cloth is not serviceable, and a wish has been expressed that we would adopt the style of binding used on the old series, *i. e.*, heavy board sides covered with marble paper, and morocco backs and corners.

Believing that the latter style of binding will better please a large portion of our readers, we commenced on the expiration of Volume VII. to bind the sheets sent to us for the purpose in heavy board sides, covered with marble paper and leather backs and corners.

The price of binding in the above style is 75 cents. We shall be unable hereafter to furnish covers to the trade, but will be happy to receive orders for binding at the publication office, No. 37 Park Row, New York.

RATES OF ADVERTISING.

Twenty-five Cents per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that en words average one line. Engravings will not be admitted into our advertising columns and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

INCRUSTATIONS PREVENTED WITHOUT INJURY.—Winans's Powder eight years in use, no better reference needed except a trial. Cost about 10 cents a day. H. N. WINANS, 11 Wall street, New York, 24 4*

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LILLY'S PATENT WELL CURB, SIMPLEST AND best in use. Patented Nov. 10, 1863, No. 40, 569. Town, County and State rights for sale. Address J. LILLY, Castle Creek, N. Y. 24 6

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LESSONS AND PRACTICAL NOTES ON STEAM.—The Steam-Engine, Propellers, &c., &c., for young Marine Engineers, Students, and others. By the late W. R. King, U. S. N. Revised by Chief-Engineer J. W. King, U. S. Navy. Eighth Edition, enlarged. 8vo. cloth. $2.

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Copies sent free by mail on receipt of price. Published by D. VAN NOSTRAND, 192 Broadway, New York. 24 2

ECONOMY OF FUEL.—NO USE FOR CHIMNEYS.—Engineer Gerner's system saves fully 50 per cent of fuel. One thousand six hundred factories and steamers have been fitted. Drawings and models showing the application of this system to different kinds of furnaces can be seen and all information obtained. Pamphlets free on application. J. E. STEVENSON & CO., Agents, 200 Broadway, New York. 24 4*

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PROPOSALS FOR TIMBER FOR THE NAVY.

BUREAU OF ORDNANCE, NAVY DEPARTMENT,
November 16, 1863.

Sealed Proposals, indorsed "Proposals for Timber," will be received at this Bureau until 3 o'clock P. M., of the 20th day of December next, for furnishing and delivering under contract, at the several Navy-yards at Portsmouth, N. H., Boston, New York, and Philadelphia, the following described timber and plank, for Ordnance purposes:—

Class 1. White Oak for Gun Carriages.
Class 2. White Pine and White Wood.
Class 3. White Ash and Hickory.
Class 4. Gum Logs.

Separate offers must be made for the supply at each of the Navy-yards named, and for the White Oak and the Hickory, White Wood, White Ash, and Pine; but the offers must be for all of each description for each Navy-yard.

Bidders are referred to the Ordnance officers at the several Navy-yards and stations, and to the Chief of the Bureau of Ordnance, Navy Department, who will furnish them with printed schedules, giving description of the "Timber," time of deliveries, and other particulars. H. A. WISE, Chief of Bureau. 23 4.

PATENT SOLID EMERY WHEELS.—THE NEW YORK Emery Wheel Company, after a long series of experiments have so perfected the method of manufacture of their improved wheels as to be able in future to fill promptly all orders for wheels in quantities. Our invention is pronounced by all who have used our improved wheel to be superior in every respect to any method heretofore known for combining emery for cutting, grinding or polishing purposes. Emery hones, knife sharpeners, &c., constantly on hand. Send for circular and price list. Office No. 51 Beekman street (up-stairs). New York. 23 4*

OUR SOCIAL RELATIONS.—MARRIAGE CUSTOMS.—Wedding Presents—The Ring—Superstitions—The Old Marriage Service—An English Wedding—The Norwegian Bride—Her Portrait and Dress—Russian Customs—Marriage among Armenians—Divorce—What is Love?—Longevity.

MAN AND WOMAN—Differences in Physiology, Phrenology, Physiognomy and in Character. With engraved Figures and Portraits. Marriage of Consanguinity—Women Shows in Russia—Blue Eyes Preferred—Imbeciles—Air and Light—Power of Sunshine—The Empress Eugenie, &c., in December PHRENOLOGICAL JOURNAL. Double No. Only 15 cents. By first post. New vol. begins with the January No. $1 50 a year. Now is the time to subscribe. Address
23 2 FOWLER & WELLS, No. 308 Broadway, N. Y.

BOILER FOR SALE, 30 FEET LONG, 6 FEET SHELL, 3 feet flue, 3/8 iron, good as new, now running, and to be seen at the Excelsior Refinery, foot of South-second street, Williamsburgh. 23 2*

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ARCHBISHOP WHATELY AND MR. NELSON SIZER —Their Portraits, Biographies, and Characters—A Compound Nature—How Ghosts are made—Incongruities of Character—What might be done with Money—How the Savage Reckons Figures—Doing Good. TOBACCO—Its Effects on Body and Mind—Temperate Smoking—The Hair Trade—Light Hair, Brown Hair, Black Hair—Shearing the Girls—Extent of the Trade—Railways of the World—Extent—Cost—Influence on Civilization—The Two Great Empires, Russia and America—with interesting facts, in the December—Double number—PHRENOLOGICAL JOURNAL and LIFE ILLUSTRATED. Only 15 cents. By first mail. A new volume in January. Now is the time to subscribe $1 50 a year. Address FOWLER & WELLS, No. 08 Broadway, New York. 23 2

PROPOSALS FOR HEAVY PROJECTILES.

ORDNANCE OFFICE, WAR DEPARTMENT,
WASHINGTON, Nov. 16, 1863.

Sealed proposals will be received at this office until 4 o'clock, P. M., on the 15th of December next, for Heavy Projectiles, to be delivered in the following quantities, at the undernamed arsenals, viz:—

AT THE WATERTOWN ARSENAL, MASS.
2,000 15 inch battering shot
2,000 5-inch shells
8,000 10-inch shot
5,000 10-inch shells

AT THE WATERVLIET ARSENAL, WEST TROY, N. Y
1,000 15 inch battering shot
1,000 15-inch shells
4,000 10-inch shot
2,000 10-inch shells

AT THE U. S. ARSENAL, GOVERNOR'S ISLAND, N. Y.
3,000 15-inch battering shot
3,000 15-inch shells
10,000 10-inch shot
8,000 10 inch shells

AT THE ALLEGHANY ARSENAL, PITTSBURGH, PA.
1,000 15-inch battering shot
1,000 15-inch shells
6,000 10-inch shot
3,000 10-inch shells

AT THE ST. LOUIS ARSENAL, ST LOUIS, MO.
2,000 10-inch shot
2,000 10-inch shells

AT THE WASHINGTON ARSENAL, WASHINGTON, D. C.
1,000 15-inch battering shot
1,000 15-inch shells
2,000 10-inch shot
3,000 10-inch shells.

The Projectiles are to be made of the kind of metal, and inspected after the rules laid down in the Ordnance Manual, with the exception of the 15-inch battering shot, which are to be made of gun metal, of tensile strength, ranging between 28,000 and 30,000 pounds to the square inch, and these must be cast from a reverberatory or air furnace. The metal is to be charcoal iron, and the sample to be tested is to be taken from the projectile.

Drawings of all these projectiles can be seen at any of the arsenals where they are to be delivered. The projectiles are to be inspected at the foundry where cast, but must be delivered at the various arsenals, free of charge for transportation or handling until delivered at the arsenal. Deliveries must be made at the rate of not less than five per cent per week, of the number of projectiles contracted for; the first delivery to be made within 30 days after the date of contract, and any failure to deliver at a specified time will subject the contractor to a forfeiture of the number he may fail to deliver at that time.

Separate bids must be made for each kind of projectiles; and if any bidder proposes to deliver at different arsenals, separate bids must be made for each kind at each place.

No bid will be considered from parties other than regular founders, or proprietors of works, who are known to this Department to be capable of executing the work contracted for in their own establishments.

Each party obtaining a contract will be required to enter into bonds, with approved sureties, for its faithful execution.

The Department reserves to itself the right to reject any or all bids, if not deemed satisfactory, for any cause.

Proposals will be addressed to "Brigadier-General George D. Ramsay, Chief of Ordnance, Washington, D. C.," and will be endorsed "Proposals for Heavy Projectiles."

GEORGE D. RAMSAY,
22 3 Brigadier-General, Chief of Ordnance.

ORDNANCE OFFICE,
WAR DEPARTMENT, Washington, Nov. 20, 1863.

That portion of the foregoing advertisement which relates to 15-inch Battering Shot, is withdrawn for the present.

GEO. D. RAMSAY,
Brigadier General Chief of Ordnance,

STEREOSCOPTICONS, MAGIC LANTERNS AND DISSOLVING View Apparatus with either the ox-hydrogen, ox-calcium, or kerosene oil light, by which pictures can be thrown on a screen and magnified to either 8, 10, 15, 20, 25, or 30 feet in diameter, according to the size of the rooms. Photograph Scenes in America and Europe, pictures of places, incidents and battles of the present rebellion in great numbers from the above instruments. On hand and made by JAMES W. QUEEN & Co., Manufacturing Opticians, 924 Chestnut street, Philadelphia. Priced and illustrated Catalogue free. 22 3*

PROPOSALS FOR MORTAR SHELLS.

ORDNANCE OFFICE, WAR DEPARTMENT.
WASHINGTON, Nov. 18, 1863.

Sealed Proposals will be received at this office until 4 o'clock P. M., on the 22d of December next, for the delivery of fifty thousand 10-inch mortar shells, in the following quantities at the following arsenals, viz:—

At the Watertown Arsenal, Watertown, Mass., 5,000.
At the Watervliet Arsenal, West Troy, N. Y., 5,000.
At the New York Arsenal, Governor's Island, 25,000.
At the Alleghany Arsenal, Pittsburgh, Pa., 5,000.
At the U. S. Arsenal, Washington, D. C., 5,000.
At the U. S. Arsenal, St. Louis, Mo., 5,000.

These shells are to be made of the kind of metal, and inspected after the rules laid down in the Ordnance Manual. Drawings can be seen at any of the United States Arsenals. The shells are to be inspected at the foundry where cast, free of charge for transportation, or handling until delivered at the Arsenal.

Deliveries must be made at the rate of not less than five per cent. per week of the number of projectiles contracted for; the first delivery to be made within twenty days after the date of the contract, and any failure to deliver at a specified time will subject the contractor to a forfeiture of the number he may fail to deliver at that time.

Separate bids must be made for each Arsenal if the bidders propose to deliver at more than one. No bid will be considered from parties other than regular founders or proprietors of works, who are known to this Department to be capable of executing the work contracted for in their own establishments.

Each party obtaining a contract will be required to enter into bonds, with approved sureties for its faithful execution.

The Department reserves the right to reject any or all bids, if not deemed satisfactory, for any cause.

Proposals will be addressed to "Brigadier-General George D. Ramsay, Chief of Ordnance, Washington, D. C.," and will be endorsed "Proposals for Mortar Shells." GEORGE D. RAMSAY,
23 3 Brigadier-General, Chief of Ordnance.

NERVOUS DISEASES AND PHYSICAL DEBILITY, arising from Specific causes, in both sexes—new and reliable treatment, in Reports of the Howard Association—sent in sealed letter envelopes, free of charge. Address Dr. J. SKILLIN HOUGHTON, Howard Association, No. 2 South Ninth street, Philadelphia, Pa. $24 12*

SAVING OF FUEL TO PARTIES USING STEAM.—DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel, and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY No 5 Park Place, New York. 24 26*

MUSICAL BOXES—PLAYING 1, 2, 3, 4, 6, 8, 10, 12 16, and 24 different tunes. Harmoniphone, Organocleide, Mandoline, Expressive Forte-Piano, Flute, Drum, Bell and Castinet accompaniments. Toy Musical Boxes—a fine and durable article for children. My stock of Musical Boxes is the only complete one to be found in this country. Price from $2 75 to $400. M. J. PAILLARD Importer, No. 21 Maiden Lane (up-stairs), New York. Musical boxes repaired. 17 5*

A VALUABLE WORK FOR INVENTORS PATENTEES AND MANUFACTURERS.

The publishers of the SCIENTIFIC AMERICAN have just prepared, with much care, a pamphlet of information about Patents and the Patent Laws, which ought to be in the hands of every inventor and patentee, and also of manufacturers who use patented inventions. The character of this useful work will be better understood after reading the following synopsis of its contents:—

The complete Patent Law Amendment Act of 1861—Practical Instructions to Inventors, how to obtain Letters Patent, also about Models—Designs—Caveats—Trade-marks—Assignments—Revenue Tax—Extensions—Interferences—Infringements—Appeals—Re-issues of Defective Patents—Validity of Patents—Abandonment of Inventions—Best Mode of Introducing them—Importance of the Specification—Who are entitled to Patents—What will prevent the Granting of a Patent—Patents in Canada and European Patents—Schedule of Patent Fees; also a variety of miscellaneous items on patent law questions.

It has been the design of the publishers to not only furnish, in convenient form for preservation, a synopsis of the PATENT LAW and PRACTICE, but also to answer a great variety of questions which have been put to them from time to time during their practice of upwards of *seventeen years*, which replies are not accessible in any other form. The publishers will promptly forward the pamphlet by mail, on receipt of six cents in postage stamps.

Address MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, No. 37 Park Row, New York. 9

$200, $150, $100, $50 PREMIUMS.—TO EDITORS, Ladies and Others. I will pay the above-named amounts for the best four articles on either my Soap, Saleratus, or Concentrated Potash. The article must state the writer's experience in using the goods, and must be not less than ten lines, and be published in the editorial columns of any good family newspaper. Any party wishing to compete for the above, and desiring further information, may address the undersigned. Each person writing and publishing a notice, as above, will mail a marked copy of the paper containing the notice to me, and also write me by mail, giving full address. The Premiums will be awarded on the fourth day of July, 1864. B. T. BABBITT, 64 to 74 Washington street, New York. 12 tf

NEW HAVEN, CONN., Oct. 22, 1863.

To B. T. BABBITT:

SIR:—Observing your Premium advertisement in the SCIENTIFIC AMERICAN, I concluded to state, in a few words, what I knew of the merits of your soap, having used it enough to conscientiously say that it is all that it is represented to be.

I wish to ask you if it is necessary to write my name in full under the article, should I put it in one of the New Haven papers.

If the article, which is on the next page, is of no account, please say so, and that will end the matter; if it is acceptable, it will appear in the paper immediately. J. D. W.

The right, golden day that ever gave
The world a man who cares to save
Sometimes the toil of womankind.
Or man with an ingenious mind
Bestows a real gift to us;
Because experience proves it thus.
In every way its claims to aid,
There's none but true assertions made.
Thus to affirm the truth we're bold,
Since using *this* we are not sold;
Saving our time and patience too—
Our friends will find this statement true.
One single trial, and you can
Perceive that BABBITT is the man.

J. D. W.

LIFE IN CHINA: COSTUME AND CASH—RELIGIOUS Worship—Chinese Robbers—Boxers—Geomancy, and "Spirit-Writing"—Questions and Answers.

INTERMIXTURE OF RACES IN AMERICA—Is the Red Race Doomed? Indian Blood in High Life—How the Intermixture takes place—The Results of Amalgamation.

FAIR HAIR AND DARK HAIR—Spurzheim on the "Union"—His Prophetic Word—Self-praise—Our Lectures in England—Abuse of Crinoline—Substitute for Coffee—To my Children. One Hundred Years to Come—The Minister—Poems—Language of the Eyes—Bad Manners—Choice of Pursuits—What has Phrenology done for you? Replies—Voice of Animals—Webster's Great Speech—Features of the Feet, &c., in the PHRENOLOGICAL JOURNAL. Double number for December. 15 cents. By first post. A new volume begins in January. Subscribe now. $1 50 a year. Address FOWLER & WELLS, No. 308 Broadway, New York. 23 2

A NEW PATENT DRIER—WHICH IS EQUAL TO the English, but much cheaper, QUARTERMAN & SON, 114 John street, New York. 22 3m

THE SUBSCRIBER IS SOLE AGENT FOR A. A. SAGE'S "Yeast Riser." Persons wishing to purchase rights will address A. SNIDER, Armada, Mich. 22 6*

FOR SALE.—A VERTICAL LOW PRESSURE BEAM Engine 40-inch cylinder—5 foot stroke—with Sickel's cut-off, and two heavy tubular boilers, has run three years. Price $4,000. Apply to Box 2,101, Philadelphia Post-office, Pa. 23 2*

MATHEMATICAL INSTRUMENTS FOR ENGINEERS, Surveyors, Architects and Schools—Levels, Transits, Surveying Compasses, Drafting instruments, of brass and German Silver, of English, French, German and Swiss manufacture. For sale wholesale and retail by JAMES W. QUEEN & Co., 924 Chestnut street, Philadelphia. 22 3*

FAIRMAN & WILLARD, MANUFACTURERS AND Dealers in Machinery, Steam Engines, Lathes, Planers, Drills, Chucks, Belting, and all kinds of supplies for railroad and machine shops. No. 58 John street, New York. 22 3*

SEWING MACHINES.—GROVER & BAKER'S NEW Lock-stitch Machine, No. 9, 495 Broadway. This is the best and cheapest machine for Tailors' use ever produced. Price $45. 13 13*

WHEELER & WILSON'S HIGHEST PREMIUM SEWING MACHINES and FOOTE'S PATENT UMBRELLA STANDS, 505 Broadway, N. Y. 17 3s

FAN BLOWERS—DIMPFEL'S, ALDEN'S, MCKENZIE'S and others, for Steamboats, Iron Works, Founderies, Smith Shops, Jewelers, &c., on hand for sale by LEACH BROTHERS, 86 Liberty street, New York. 15 13*

FOR SALE.—VOLUMES 2 TO 12 OF THE SCIENTIFIC AMERICAN (old series), in good order and well bound. For price address A. G. BUELL, Rochester, N. Y. 23 4*

A MESSIEURS LES INVENTEURS.—AVIS IMPORTant. Les inventeurs non familiers avec la langue Anglaise, et qui préféreraient nous communiquer leurs inventions en Français, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confidence. MUNN & CO., Scientific American office, No. 37 Park Row, New York.

THE CHEAPEST MODE OF INTRODUCING INVENTIONS.

INVENTORS AND CONSTRUCTORS OF NEW AND useful Contrivances or Machines, of whatever kind, can have their Inventions illustrated and described in the columns of the SCIENTIFIC AMERICAN on payment of a reasonable charge for the engraving.

No charge is made for the publication, and the cuts are furnished to the party for whom they are executed as soon as they have been used. We wish it understood, however, that no second-hand or poor engravings, such as patentees often get executed by inexperienced artists for printing circulars and handbills from, can be admitted into these pages. We also reserve the right to accept or reject such subjects as are presented for publication. And it is not our desire to receive orders for engraving and publishing any but good Inventions or Machines, and such as do not meet our approbation in this respect, we shall decline to publish.

For further particulars address—

MUNN & CO.,
Publishers of the SCIENTIFIC AMERICAN,
No. 37 Park Row, New York City

GROVER & BAKER'S CELEBRATED SEWING MACHINES were awarded the highest premiums over all competitors at the recent State Fairs of New York, Vermont, Iowa, Michigan, Indiana, Illinois, Kentucky, Pennsylvania, Ohio, and at every Institute and county Fair where exhibited this year. Salesrooms 49 Broadway, New York. 19tf

PAYE'S PATENT FORGE HAMMER—ADAPTED TO both heavy and light forgings, with an adjustable stroke of from one inch to three feet, on hand for sale by LEACH BROTHERS, 86 Liberty street, New York. 15 13*

OIL! OIL! OIL For Railroads, Steamers, and for Machinery and Burning. PEASE'S Improved Engine and Signal Oil, indorsed and recommended by the highest authority in the United States. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The SCIENTIFIC AMERICAN, after several tests, pronounces it "superior to any other they have ever used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No. 61 Main street, Buffalo, N. Y.

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IRON PLANERS, ENGINE LATHES, DRILLS AND other machinists' tools, of superior quality, on hand and finishing, for sale low. For description and price address NEW HAVEN MANUFACTURING COMPANY, New Haven, Conn. 1tf

BOLTS, NUTS AND WASHERS OF ALL SIZES CONstantly on hand for sale by LEACH BROTHERS, 86 Liberty street New York. 15 13*

PORTABLE STEAM ENGINES—COMBINING THE maximum of efficiency, durability and economy with the minimum of weight and price. They are widely and favorably known, more than 200 being in use. All warranted satisfactory or no sale. A large stock on hand ready for immediate application. Descriptive circulars sent on application. Address J. C. HOADLEY, Lawrence, Mass. 16 13

WATER WHEELS.—WARREN'S TURBINE WHEEL and improved oil stop, is acknowledged by cotton and woolen manufacturers, and those who are making the greatest saving in the use of water, to be superior to all other wheels in the country. For illustrated circular, address A. WARREN, Agent, American Water Wheel Company, No 31 Exchange street, Boston, Mass. 14 12*

HARRISON'S GRIST MILLS—20, 30, 36 AND 48 inches diameter, at $100, $200, $300 and $400, with all the modern improvements. Also, Portable and Stationary Steam Engines of all sizes, suitable for said mills. Also, Bolters, Elevators, Belting, &c. Apply to S. C. HILLS, No. 12 Platt-street, New York. d

GRINDSTONES.—OHIO, NOVA SCOTIA, NEWCASTLE, French, &c., all sizes for sale by WALTER R. WOOD & Co. Yard Nos. 283 and 285 Front street, New York. Quarry, Berea, Ohio. 22 5*

GUILD & GARRISON'S CELEBRATED STEAM Pumps—Adapted to every variety of pumping. The principal styles are the Direct Action Excelsior Steam Pump, the improved Balance Wheel Pump, Duplex Vacuum and Steam Pumps, and the Water Propelier, an entirely new invention for pumping large quantities at a light lift. For sale at Nos. 55 and 57 First street, Williamsburgh, and No. 74 Beekman street, New York. 14tf GUILD, GARRISON & CO

BLACK DIAMOND STEEL WORKS, PITTSBURGH Pa. PARK, BROTHER & CO., manufacturers of best quality Refined Cast Steel, square, flat and octagon, of all sizes. Warranted equal to any imported or manufactured in this country. Office and Warehouse, Nos. 149 and 151 First street, and 120 and 122 Second street, Pittsburgh, Pa. vol. 8 11 1y*

POWER LOOM WIRE CLOTHS AND NETTINGS, superior in quality and at low prices, by the CLINTON WIRE CLOTH COMPANY, Clinton, Mass. N. B.—Our trade-mark "Power Loom Wire Cloth." vol 8 24 31*

VULCANIZED RUBBER—

Adapted to mechanical purposes—MACHINE BELTING, STEAM PACKING, VALVES, HOSE, EMERY VULCANITE WHEELS, &c. &c. Directions, prices, &c., can be obtained on application to the NEW YORK BELTING AND PACKING COMPANY, Nos. 37 and 38 Park Row, New York.

JOHN H. CHEEVER, Treasurer. 14tf

Zur Beachtung für deutsche Erfinder.

Die Unterzeichneten haben eine Anleitung, die Erfindern das Verhalten angibt, um sich ihre Patente zu sichern, herausgegeben, und verabfolgen solche gratis an dieselben.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu addressiren an

Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.

Daselbst ist zu haben:

Die Patent-Gesetze der Vereinigten Staaten

nebst den Regeln und der Geschäftsordnung der Patent-Office und Anleitungen für den Erfinder, um sich Patente zu sichern, in den Ver. St. sowohl als in Europa. Ferner Auszüge aus den Patent-Gesetzen fremder Länder und darauf bezügliche Rathschläge; ebenfalls nützliche Winke für Erfinder und solche welche patentiren wollen.

Preis 20 Cts., per Post 25 Cts.

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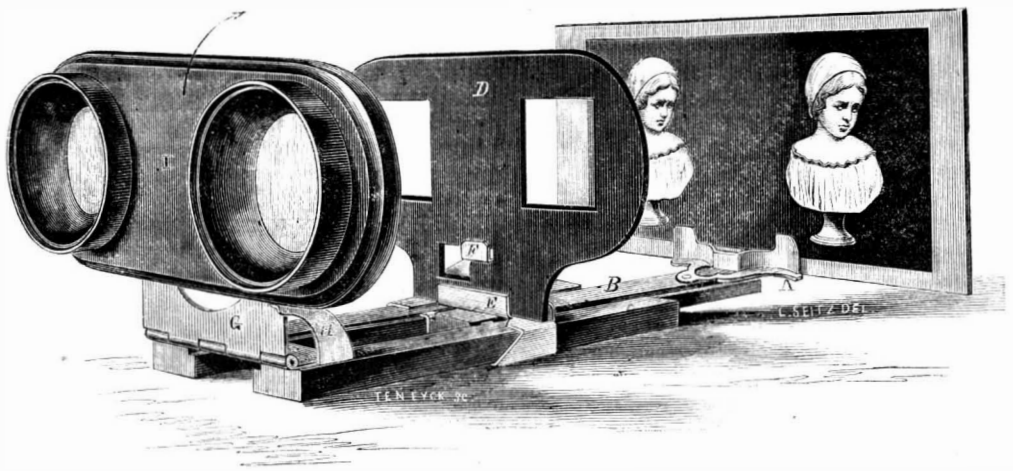
Improved Portable Stereoscope.

Probably no instrument designed for instruction and amusement has a greater hold upon public favor than the stereoscope. Some points in it, however, have been made the subject of an invention, and we herewith lay before our readers an engraving of the improved stereoscope. The one herewith illustrated has several meritorious features not embraced by any other that we have seen, and these points are—portability, combined with adjustable lenses; or (what is the same) a sliding frame or picture-holder, A, which can be set at any point desired by simply moving the tongue, B, in and out through the rabbeted slides, C. The field-piece, D, is also



WHEELER & BAZIN'S PORTABLE STEREOSCOPE.

adjustable and sets in a bracket, E, which slides over the bottom or base of the apparatus in the manner shown in the engraving; this field-piece is made adjustable to suit different-sized pictures, and can be removed from the slide; it being slipped over and retained in place by the catch, F.

The lenses are mounted in a handsome black walnut frame, and are pivoted to the hinge, G, in such a manner that when the hinge is erected the lenses and frame can be turned down in the direction shown by the arrows; this is for convenience of carrying in a pocket or box. In connection with the hinge there is a stop or catch, H, which prevents the lense frame, I, from falling down when in use. These details embrace the principal parts.

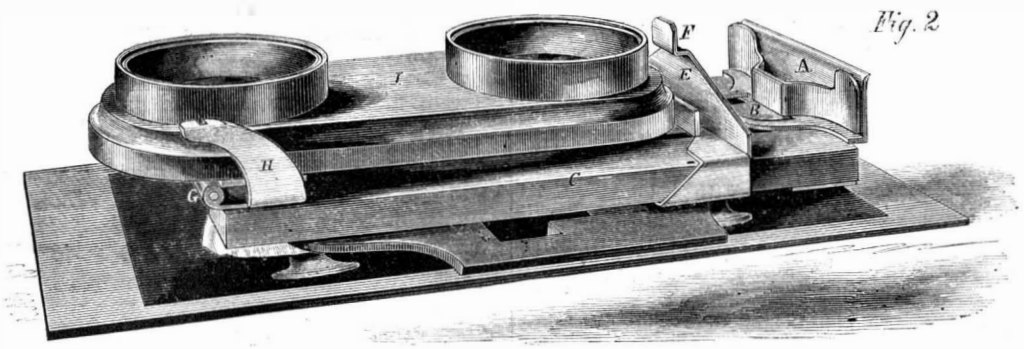


Fig. 2

It will be seen upon examination of Fig. 2, which represents the stereoscope in its folded condition, that it is an extremely simple and convenient one for the traveler or drawing-room. The mere feature of the adjustable picture-holder alone is one of great value as regards a more perfect enjoyment of the beauties of stereoscopic pictures; and its compact form, combined with the other qualities mentioned, render it a very desirable article of its kind. In Fig. 2 all the parts have similar letters of reference to those of the principal engraving. The lenses turn down in the manner shown; the field-piece is removed and placed underneath the instrument; the picture is also detached and the slide turned around, the tongue pushed in, and the whole apparatus reduced to very nearly the actual size of the engraving. A patent is ordered to issue to C. H. Wheeler & James A. Bazin, through the Scientific American Patent Agency. Further information can be had by addressing C. H. Wheeler & Co., 5 and 7 Essex street, Boston, Mass.

At a recent coal auction held in this city, on some sizes of the article there was a fall of $2 per tun.

Coal-mining Machinery.

An experiment was made recently at Mr. Middleton's factory, London, with a new coal-cutting machine, which is intended to be used as a substitute for manual labor in coal and other mines. Hitherto coal has been cut away from the seam with the pick-axe by men in a sitting or cramped position—an operation at once difficult and tedious. About fifty years ago attention was turned to devising machinery for the performance of this labor, but the machines contrived at that time, and at subsequent periods, did not pass beyond the experimental process. A few years back a Mr. Ridley took out a patent for an apparatus which very nearly solved the problem, which mining engineers, notwithstanding these discouragements, have never entirely overlooked. The great object being to economise space, he adapted to his purpose the form of a trunk engine which is employed on board steam-vessels, and produced a machine which worked a pick against the coal with sufficient power and rapidity to do the labor of many men. There was, however, one radical defect which militated considerably against its practical usefulness. In order to get the necessary length of stroke, the machine was made so long that it could not be taken round the short elbow bends and abrupt curves in a mine without much difficulty and delay. To obviate this drawback, the machine exhibited has been constructed. It is the joint invention of Mr. Ridley and Mr. James G. Jones; and also assumes the shape of a trunk engine, but is only about half the length of the former. This diminution in the length is effected by an ingenious arrangement, by means of which the connecting rod—to which the pick is attached—acts as a substitute for a piston. In this way the required length of stroke is obtained as it were within the cylinder itself. The machine is very small and compact, being only 2 feet 2 inches high and 3 feet long, with a 2 feet 6 inch pick, and when at work will be attended only by a man and a boy. It runs upon the ordinary tram used in collieries, the man sitting behind and moving it easily forward or backward by a lever or wheel. It is proposed to work the machine with compressed air, which has been successfully employed in the tunnel now in course of construction through Mont Cenis. Judging from the experiment there would seem to be little doubt of the invention answering the purpose for which it is designed, as within a few minutes a deep groove was cut along a hard stone of large dimensions. If the opposing substance had been coal there could have been little doubt that it would have been broken to pieces in the first few blows. The pick gave one hundred blows a minute with a force equal to three-quarters of a tun. The inventors state that the machine is equal to twenty-five miners, and will in eight hours undercut one hundred and fifty yards of coal to a depth of three feet.

A New Comet.—A new comet was discovered on the 14th ultimo, at Marseilles, by M. Tempel. He describes it as telescopic, its position being right ascension 9 deg. 52 min. 44 sec., and declination 34 deg. 7 min. In the course of an hour it increased a little both in right ascension and declination, so that it seems to be moving in a northwesterly direction. About the same time a comet was perceived at Amiens, but does not seem to be the same, since it is described as having a tail of an apparent length of two metres, while M. Tempel's is telescopic, with a mere rudiment of a tail.

M. Serbat, Belgium, has patented a mixture composed of 10 parts of tallow, lard, or oil, dissolved in 100 parts, by weight, of naphthaline, to be employed as a lubricating compound.

THE

Scientific American

FOR 1864!

VOLUME X.---NEW SERIES.

The publishers of the SCIENTIFIC AMERICAN respectfully give notice that the Tenth Volume (New Series) will commence on the first of January next. This journal was established in 1845, and is undoubtedly the most widely circulated and influential publication of the kind in the world. In commencing the new volume the publishers desire to call special attention to its claims as

A JOURNAL OF POPULAR SCIENCE.

In this respect it stands unrivalled. It not only finds its way to almost every workshop in the country, as the earnest friend of the mechanic and artizan, but it is found in the counting-room of the manufacturer and the merchant; also in the library and the household. The publishers feel warranted in saying that no other journal now published contains an equal amount of useful information; while it is their aim to present all subjects in the most popular and attractive manner.

The SCIENTIFIC AMERICAN is published once a week, in convenient form for binding; and each number contains sixteen pages of useful reading matter, illustrated with

NUMEROUS SPLENDID ENGRAVINGS

of all the latest and best inventions of the day. This feature of the journal is worthy of special note. Every number contains from five to ten original engravings of mechanical inventions relating to every department of the arts. These engravings are executed by artists specially employed on the paper, and are universally acknowledged to be superior to anything of the kind produced in this country.

The publishers of the SCIENTIFIC AMERICAN promise to present, as during preceding years, all the latest improvements in Steam Engineering, War Vessels, Ordnance—military and naval, Fire-arms, Mechanics' Tools, Manufacturing Machinery, Farm Implements, Wood-working Machinery, Water-wheels, Pumps and other Hydraulic Apparatus, Household Utensils, Electric, Chemical and Mathematical Instruments, Flying Machines and other Curious Inventions—besides all the varied articles designed to lighten the labor of mankind, not only in the shop and warehouse, but in every place where the industries of life are pursued.

From its commencement the SCIENTIFIC AMERICAN has been the earnest advocate of the rights of American Inventors and the

REPERTORY OF AMERICAN PATENTS.

In this important department, so vitally connected with all the great interests of the country, no other journal can lay any claim whatever; as in its columns there is published a weekly Official List of the "Claims" of all patents granted at the U. S. Patent Office.

THE PRACTICAL RECIPES

alone are oft-times worth more to the subscriber than the amount of a whole year's subscription.

TERMS OF SUBSCRIPTION.

Two volumes of the SCIENTIFIC AMERICAN are published each year, at $1·50 each, or $3 per annum, with correspondingly low terms to Clubs; $1 will pay for four months' subscription. The numbers for one year, when bound in a volume, constitute a work of 832 pages of useful information, which every one ought to possess. A new volume will commence on the first of January, 1864.

CLUB RATES.

Five Copies, for Six Months	$ 6
Ten Copies for Six Months	12
Ten Copies, for Twelve Months	20
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